

### 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

#### 3.1 Location, Setting, and Historical Use

The DQEP area is located at the northeast end of Sheep Mountain, approximately 6 miles southwest of Douglas in south central Converse County, Wyoming (figure 1.1-1). Topography ranges from steep, rugged rock outcrops to relatively gentle slopes in the northeast portions of the project area. Elevations within the DQEP area range from approximately 5,200 to 5,450 feet above mean sea level (AMSL). The proposed quarry would be located several hundred feet below the crest of Sheep Mountain, which reaches an elevation of 6,230 feet, approximately about 1.25 miles south of the proposed project area, and would not be visible from the west side of Sheep Mountain.

The DQEP area has historically been used for livestock grazing, wildlife habitat, recreation, and aggregate mining from the quarry. This area provides limited summer and fall gazing for cattle, sheep and horses. However, stocking rates are low due to the rugged terrain and relatively low vegetation productivity (SCS 1988).

#### 3.2 Critical Elements of the Human Environment

Critical elements of the human environment as defined by the BLM (1988), their status in the proposed project area, and their potential to be affected by the Proposed Action or alternatives are presented in table 3.2-1. A review of the Proposed Action and possible alternatives has determined that eight of the 12 critical elements of the human environment are not present in the DQEP area, are not affected by the Proposed Action or alternatives, and therefore are not discussed further in this EA analysis. Four critical elements (air quality, cultural resources, threatened and endangered species, and water quality) are present in the proposed project area, may be affected by the Proposed Action or alternatives. These elements are discussed in detail in this EA.

**Table 3.2-1: Critical Elements of the Human Environment<sup>1</sup>**

Element	Status	Analyzed in this EA
Air quality	Potentially affected	Yes
Areas of critical environmental concern	Not present	No
Cultural resources	Potentially affected	Yes
Environmental justice related issues	Not present	No
Farmlands (prime or unique)	Not present	No
Floodplains	Not present	No
Native American religious concerns	Not present	No
Threatened and endangered species	Potentially affected	Yes
Water quality	Potentially affected	Yes
Wetlands/riparian areas	Not present	No
Wild and scenic rivers	Not present	No
Wilderness (wilderness study areas and wilderness areas)	Not present	No

<sup>1</sup> From the BLM NEPA Handbook H-1790-1 (BLM 1988, 1999a).

Based on comments received from the public during a BLM-sponsored open house for the proposed project held in Douglas, Wyoming on February 22, 2011 and additional comments

received on the project proposal, this EA will also analyze potential impacts of the Proposed Action and alternatives on noise, socioeconomics, soil resources, transportation, vegetation, visual resources, and wildlife. Other resource values (e.g., water rights, fisheries, wild horses, land ownership patterns, and land status) would not be affected by the Proposed Action or alternatives and, these resources are not be analyzed in this EA.

### 3.3 Environmental Elements Considered with Minor or No Effects

The proposed DQEP area is situated entirely upon private surface estate owned by Mr. James Huxtable. The quarry site itself is situated on a rocky ridge with little value for livestock grazing purposes, and the access road has already been constructed. The DQEP area provides limited summer and fall grazing for cattle, sheep, and horses, but stocking rates are low due to the rugged terrain and relatively sparse vegetation. Consequently, impacts to range resources within the DQEP area will not be addressed further in this EA.

### 3.4 Overview of Analysis Approach

Potential impacts are described in terms of type, context, duration, and intensity. General definitions of these terms are below.

- Type describes the impact as beneficial or adverse, direct or indirect.

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect on a resource by an action at the same place and time. For example soil compaction from construction traffic is a direct impact on soils.

Indirect: An effect from an action that occurs later or perhaps at a different place and often to a different resource, but is still reasonably foreseeable. For example removing vegetation may increase soil erosion and cause increased sediment in a stream.

Cumulative: Impacts to resources that are added to existing impacts from other actions. For example, surface water sediment runoff from the project, added to the sediment load from other unrelated projects in the area, may produce additional decrease in surface water quality.

- Context describes the area (site-specific) or location (local or regional) in which the impact will occur.
- Duration is the length of time an effect will occur.

Short-term impacts generally occur during construction or for a limited time thereafter, generally less than two years, by the end of which the resources recover their pre-construction conditions.

Long-term impacts last beyond the active mining period, and the resources may not regain their pre-mining conditions for a longer period of time. For example, visual impacts from the quarry would be long-term since they continue until project closure and reclamation is complete.

- The intensity of an impact is based on how the Proposed Action would affect each resource. The levels used in this EA are as follows.

Negligible: Impact at the lowest levels of detection with barely measurable consequences.

Minor: Impact is measurable or perceptible, with little loss of resource integrity and changes are small, localized, and of little consequence.

Moderate: Impact is measurable and perceptible and would alter the resource but not modify overall resource integrity, or the impact could be mitigated successfully in the short-term.

Major: Impacts would be substantial, highly noticeable, and long-term. (If the BLM authorizing officer determines a major impact is significant, preparation of an Environmental Impact Statement would be required for the project.)

### **3.5 Climate and Air Quality**

#### **3.5.1 Affected Environment**

The study area for climate and air quality includes the project site and surrounding area.

##### **3.5.1.1 Climate**

The proposed project would not have short- or long-term, measurable direct, indirect, or cumulative effects on climate, and no further discussion of climate impacts is provided in this EA. Information on climate is provided as background information pertinent to the air quality and noise analyses. Specifically, climatic (atmospheric) conditions determine the dispersion and transport of pollutants, and wind can occasionally be a major contributor to overall noise and which affects the timing, location, and intensity of man-made noise perceived at local noise sensitive receptors.

The climate of the project area varies with terrain and elevation and is influenced by the surrounding topographical features. Table 3.5-1 shows annual average precipitation and maximum and minimum average temperature data.

**Table 3.5-1: Annual Average Precipitation and Temperature**

Station Name	Average Annual Precipitation (inches)	Annual Temperature (Max/Min)	Period of Record
Douglas, WY	13.96	87.4/11.4	1909- 9/30/2010
Casper, WY	13.9	88.8/15.9	1909- 9/30/2010
<b>Source:</b> WRCC 2010			

The prevailing wind directions are from the west and southeast with an average annual speed of approximately 10 miles per hour (mph) (WRCC 2010). Average hourly and monthly wind speeds for Douglas, Wyoming are displayed in table 3.5-2. Although the average annual wind speed for Douglas, Wyoming is about 10 mph, persistent winds associated with winter and spring weather fronts can reach 30 to 40 mph with gusts up to 50 and 60 mph. In addition, terrain can have local effects on wind direction and speed. For example, although there is no prevailing wind data for the Douglas Quarry site, average wind speeds in the vicinity of the quarry and along the base of Sheep Mountain are likely to be higher than in nearby Douglas since prevailing west winds coming off the east slope of Sheep Mountain are accelerated by downslope conditions.

Wind speed is directly linked to the amount of fugitive dust that is generated. Fugitive dust increases with higher wind speeds, especially in drier areas. Wind speed also can affect the timing, location, and intensity of man-made noise perceived at local noise sensitive receptors. Noise is discussed in depth in section 3.6. Atmospheric conditions such as fugitive dust and humidity can also have an effect on visual resources by reducing the intensity of colors of the visual acuity of landscape features.

### 3.5.1.2 Air Quality

The planning area has no regions that are designated as nonattainment for National Ambient Air Quality Standards (NAAQS) or Wyoming Ambient Air Quality Standards (WAAQS).

### **Applicable Laws and Regulations**

Federal actions must conform to the *Clean Air Act* (CAA). The Environmental Protection Agency (EPA) has primary federal responsibility for implementing the CAA. In Wyoming, the WDEQ/AQD administers CAA requirements. Wyoming has developed state implementation plans (SIPs) that describe how each state assures compliance with the CAA.

The EPA develops NAAQS. No site-specific air quality data are available for the proposed project area, but air quality is generally good and complies with the NAAQS for all critical pollutants. This includes compliance with standards for carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, particulate matter, and lead. This means that the project is located within an “attainment” area (EPA 2010). Table 3.5-3 shows selected national and Wyoming ambient air quality standards.

**Table 3.5-2: Average Hourly and Monthly Wind Speeds (mph) for Douglas, Wyoming**

Month	Hour												
	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	
Jan	8	8	8	8	8	8	8	8	9	10	11	13	
Feb	7	8	7	7	8	8	8	8	9	11	12	14	
Mar	8	8	8	8	8	8	8	9	11	13	14	15	
Apr	9	9	8	8	8	8	9	11	13	14	15	16	
May	8	8	7	7	7	7	9	11	12	13	14	14	
Jun	8	8	7	7	7	7	8	9	10	11	11	12	
Jul	7	7	6	6	5	5	7	7	8	9	10	10	
Aug	7	7	6	6	6	5	6	8	9	10	11	11	
Sep	7	6	6	6	6	6	6	7	9	10	11	12	
Oct	7	7	7	7	7	7	7	8	10	11	13	14	
Nov	7	7	7	7	7	7	8	8	9	11	13	15	
Dec	8	8	8	8	8	8	8	8	9	10	12	14	
Yearly Avg.	8	8	7	7	7	7	8	8	10	11	12	13	
Month	Hour												Avg/ month
	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am	
Jan	14	15	14	12	10	9	8	8	8	8	8	7	9.5
Feb	14	14	15	13	12	10	9	8	8	8	8	8	9.6
Mar	16	16	16	15	14	11	10	9	8	9	9	8	10.9
Apr	16	16	16	16	15	13	11	10	9	10	9	9	11.7
May	15	15	15	15	14	13	11	11	10	9	9	8	11.0
Jun	13	13	13	13	14	13	12	11	10	10	9	8	10.2
Jul	10	11	11	12	12	12	11	10	9	8	8	8	8.9
Aug	12	11	12	12	12	12	11	10	10	9	8	8	9.2
Sep	13	13	13	13	12	10	9	9	8	8	7	7	8.8
Oct	14	14	14	13	11	9	8	8	8	8	8	8	9.4
Nov	16	16	15	12	10	9	8	8	8	8	7	7	9.6
Dec	15	15	14	12	10	9	9	9	9	8	8	8	9.9
Annual Avg.	14	14	14	13	12	11	10	9	9	8	8	8	9.9

**Source:** WRCC 2010. Data is for the period from January 1, 2000 through December 31, 2010.

Under the CAA, proposed new sources of air pollutants must obtain construction and operating permits. The project has obtained a state air quality permit (CT-10985) from the WDEQ/AQD for portable crushing/screening equipment. Effects on air quality would be limited to the vicinity of the construction and operations activities. The permit contains conditions for project compliance.

**Air Pollutants of Potential Concern**

Particulates are the air pollutants of potential concern for the project. Pollutants would occur primarily from long-term operations of crushing/screening equipment, diesel generators, haul trucks, and miscellaneous vehicles. These operations represent particulate matter as well as carbon monoxide (CO) from exhaust emissions. The majority of particulate matter consists of

solid particles, such as the dust generated from crushing/screening operations and haul trucks on the dirt haul road.

**Table 3.5-3: National and Wyoming Ambient Air Quality Standards**

Air Pollutant	Averaging Time Period	NAAQS <sup>1</sup>	WAAQS <sup>2</sup>
Particulate matter <10 microns in diameter (PM <sub>10</sub> )	24-hr	150µg/m <sup>3</sup>	150µg/m <sup>3</sup>
	AAM <sup>3</sup>	50µg/m <sup>3</sup>	50µg/m <sup>3</sup>
Particulate matter <2.5 microns in diameter (PM <sub>2.5</sub> )	24-hr	35µg/m <sup>3</sup>	35µg/m <sup>3</sup>
	AAM	15µg/m <sup>3</sup>	15µg/m <sup>3</sup>
Ozone	8-hour	0.08 ppm <sup>4</sup>	0.08 ppm
Nitrogen dioxide (NO <sub>2</sub> )	AAM	53 ppb <sup>5</sup>	53 ppb
	1-hour	100 ppb	100 ppb
Sulfur dioxide (SO <sub>2</sub> )	3-hour	0.5 ppm or 1300µg/m <sup>3</sup>	0.5 ppm or 1300µg/m <sup>3</sup>
	24-hour	0.14 ppm or 365µg/m <sup>3</sup>	0.10 ppm or 260µg/m <sup>3</sup>
	AAM	0.03 ppm or 80µg/m <sup>3</sup>	0.02 ppm or 60µg/m <sup>3</sup>
Carbon Monoxide (CO)	1-hour	35 ppm or 40,000µg/m <sup>3</sup>	35 ppm or 40,000 µg/m <sup>3</sup>
	8-hour	9 ppm or 10,000µg/m <sup>3</sup>	9 ppm or 10,000µg/m <sup>3</sup>

<sup>1</sup>NAAQS – National Ambient Air Quality Standards (adapted from 40 CFR 50.5-50.12). Primary standard unless otherwise noted. National Primary Standards establish the level of air quality necessary to protect public health from any known or anticipated effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.  
<sup>2</sup>WAAQS – Wyoming Ambient Air Quality Standard (adapted from WDEQ/AQD [2010].  
<sup>3</sup>AAM – annual arithmetic mean  
<sup>4</sup>ppm – parts per million  
<sup>5</sup>ppb – parts per billion

Two standards have been established for PM, one addressing particles of 10 microns or less (PM<sub>10</sub>), and another for particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). The very small “fine” particles, PM<sub>2.5</sub> and smaller, are considered to be the greatest potential health concern. Most of these fine particles come from combustion processes, for example, vehicle exhaust. Smaller dust particles impact visibility to a greater extent than larger particles. As noted above, the project is located in an attainment area for all NAAQS (EPA 2010).

### 3.5.2 Environmental Impacts and Mitigation Measures

#### 3.5.2.1 Issues and Evaluation Criteria

The primary issue is the project’s potential to violate air quality standards designed to protect the public’s health and welfare was evaluated.

The Proposed Action or alternatives would have major impacts on air quality if:

- The construction, maintenance, or operation of the Proposed Action or alternatives would violate federal or state standards shown in table 3.5.3.

#### 3.5.2.2 No Action Alternative

Under the No Action Alternative no additional mineral sales would occur. There would be no expanded development in the existing project area. Air quality in the immediate vicinity of the

quarry would return to the levels existing prior to project development once reclamation of the existing is complete. No violation of federal or state standards would likely occur during and after cessation of mining so there would be no short or long-term major impacts to air quality.

### 3.5.2.3 Proposed Action

Pollutants of concern associated with the Proposed Action are regulated by the WDEQ/AQD and primarily include total suspended particles (TSP) and particulates less than 10 microns in diameter (PM<sub>10</sub>). The Proposed Action would not have any facilities that would emit potential air pollutants or hazardous air pollutants including nitrogen oxide (NO<sub>x</sub>), sulfur oxide (SO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOC). Blasting may generate minor emissions of NO<sub>x</sub> as well as short-term and localized increases in fugitive dust emissions. Fugitive dust emissions would also occur while the quarry is operating and be limited to the active quarry work area and access (haul) roads or during extremely windy conditions outside the immediate quarry. Some fugitive dust emissions would continue until reclamation operations have been completed.

As described in “Proposed Action and Alternatives” section, the quarry operator has been issued a permit by the WDEQ/AQD division to install portable crushing and screening equipment with maximum production of 1 million tons per year or 450 tons per hour as long as all air quality standards are met as stipulated in the permit application. These standards and regulations include meeting opacity, dust suppressant, and equipment emissions levels. The proponent would also be responsible for treating and maintaining the private access (haul) road in a manner that would control fugitive dust and protect the integrity of the haul road.

The permit issued by the WDEQ/ADQ states that the proponent would comply with chapter 3, section 2(f) of the Wyoming Air Quality Standards and Regulations. This regulation requires all fugitive dust emissions to be limited to prevent unnecessary amounts of particulate matter from being airborne and require water or chemical dust suppressants on all unpaved haul roads, access roads, and work areas utilized during the operation of the Proposed Action. In the permit, condition 4 stipulates that the allowable opacity for fugitive emissions associated with the crushing equipment be limited to 12 percent, the allowable opacity for screens, conveyor transfer points and other fugitive emission points are limited to seven percent as determined by 40 CFR 60, appendix A, method 9.

Water would be the primary dust suppressant used for truck haul and mine operations to maintain compliance with the projects air quality permit. Water consumption for dust suppression is estimated at approximately 5,800 gpd (or 1.5 million gpy).

The Proposed Action would have direct, short-term, and minor adverse impacts on air quality, but would not violate air quality standards. During particularly windy days the particulate emissions from crushing activity and haul roads could extend beyond the project boundary, but would not likely exceed the Wyoming air quality standards and regulations specified in the permit issued by WDEQ/AQD.

3.5.2.4 Alternative A

Impacts for Alternatives A would be similar to the Proposed Action. However, the level of fugitive dust emissions would be reduced relative to the amount of rock mined per day. Dust emissions would be similar to current conditions at the mine. Alternative A would require less water than the Proposed Action for dust suppression. Approximately 2,200 gpd (or 420,000 gpy) would be needed compared to 5,800 gpd (or 1.5 million gpy) for the Proposed Action.

3.5.2.5 Mitigation Measures

All stipulations in the WDEQ/AQD permit CT-10985 would apply for all alternatives. No additional mitigation for air quality is required beyond the applicant-committed mitigation measures listed in section 2.1.5.

**3.6 Noise**

3.6.1 Affected Environment

Describing the environment potentially affected by noise from the proposed project involves identifying noise-sensitive receptors and existing noise sources in the project vicinity, characterizing terrain features that may affect noise transmission, and determining existing noise levels.

The proposed DQEP area is located approximately 6 miles southwest of Douglas, Wyoming. Potential noise sensitive areas in the vicinity include private residences and sensitive wildlife resources. Noise impacts to wildlife are addressed under section 3.11. Outside of sensitive wildlife resources, the other noise sensitive receptors in the area are rural residences and ranch homes. There are 12 such residences within 2 miles of the quarry pit (figure 3.6-1 and table 3.6-1). The nearest is a ranch residence slightly over 1 mile east-northeast of the quarry. There are four residences along Bed Tick Road, six residences along both sides of SH91 north of the quarry property, and one ranch residence northwest of the site.

**Table 3.6-1: Noise Sensitive Receptors**

<b>Residence</b>	<b>Bearing (degrees)</b>	<b>Distance (feet)</b>
<b>A</b>	333.0	8,600
<b>B</b>	356.0	9,500
<b>C</b>	0.5	9,600
<b>D</b>	5.0	9,100
<b>E</b>	10.0	8,200
<b>F</b>	13.0	8,300
<b>G</b>	17.5	8,550
<b>H</b>	35.0	6,700
<b>I</b>	41.0	6,300
<b>J</b>	53.0	6,100
<b>K</b>	60.5	6,400
<b>L</b>	73.5	4,550

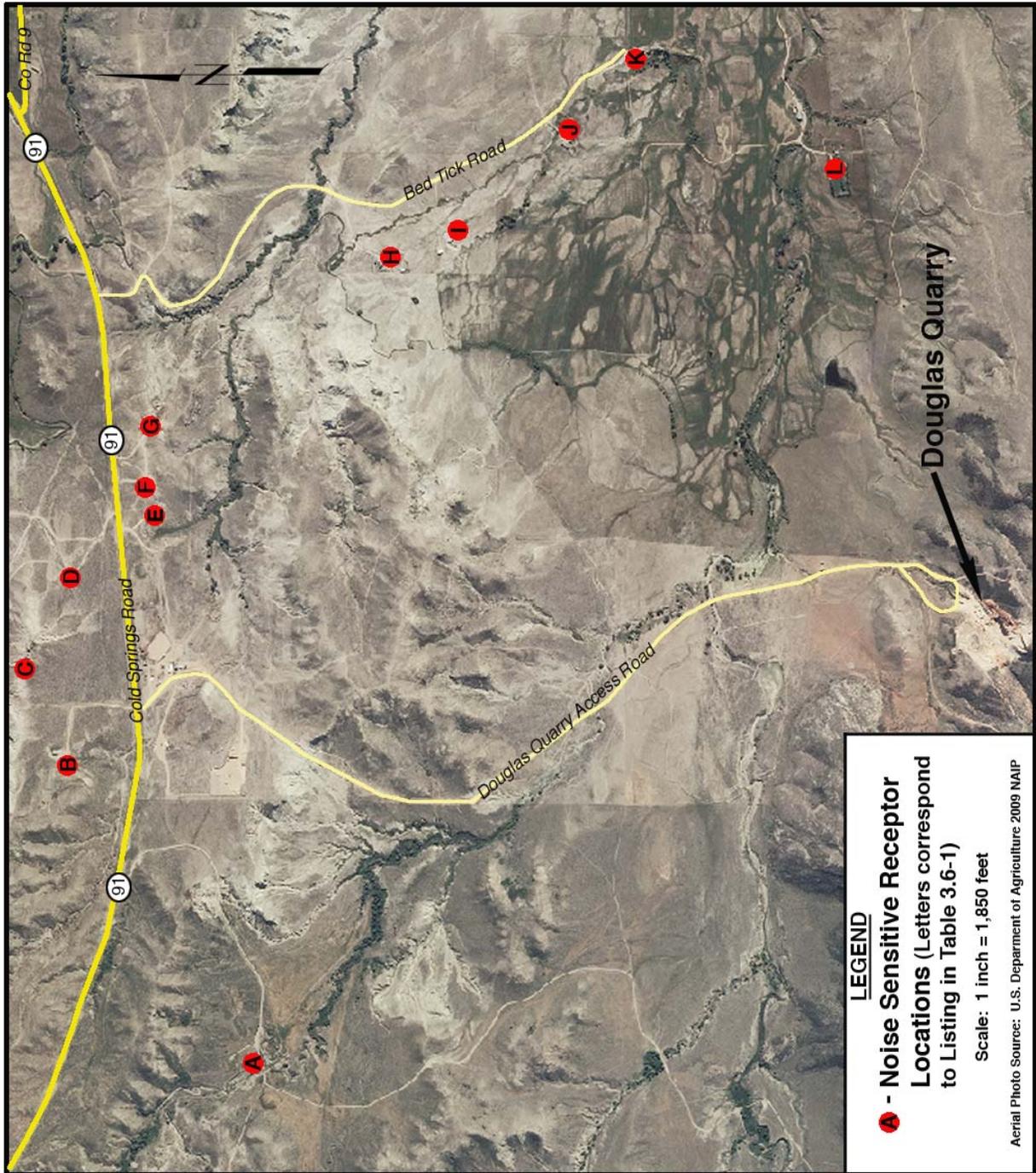


Figure 3.6-1: Locations of Noise Sensitive Receptors

The most prominent man-made noise sources in the project vicinity are the existing quarry and SH91. There are also periodic episodes of noise from agricultural machinery primarily during haying season in the late spring and summer. Natural sources of noise in the area include birds and insects, and wind, which can occasionally be a major contributor to overall noise and which affects the timing, location, and intensity of man-made noise perceived at local noise sensitive receptors. Information on wind speed near the project area is provided in section 3.5 (“Climate and Air Quality”). Several months of the year, the average wind speed exceeds 10 mph, especially from the mid-morning to late afternoon hours (table 3.5-2). Oncoming weather systems often result in prevailing winds in excess of 30 mph, especially along the base of Sheep Mountain.

Terrain in the project area is quite varied. The existing quarry faces northeast across the Bed Tick Creek valley from the lower slopes of Sheep Mountain. The floor of the existing pit is at approximately 5,200 feet. Sheep Mountain is a northwest-southeast linear ridge rising to a 6,418-foot summit approximately 1.4 miles south of the quarry. The proposed quarry expansion site is located on a north-northeast trending ridge at elevations ranging from 5,200 to 5,435 feet.

The Bed Tick Creek valley has a generally flat bottom broadening to approximately 1 mile wide to the northeast of the quarry site. The valley bottom north of the quarry site is at 5,100 feet elevation. It slopes gradually to the east at approximately 1.4 percent, or just over 75 feet per mile, until it reaches the North Platte River about 5 miles east of the quarry site.

Topography on the north side of the creek rises to a broken ridge west of Bed Tick Road and south of SH91. The ridge varies in elevation in the proposed project vicinity with a high point of 5,413 feet. Seven of the 12 potentially affected residences (A through G) benefit from some degree of quarry noise reduction due to the barrier effect of this ridge topography. Residence L also benefits from some reduction in quarry noise as a result of intervening topography.

Noise levels in the project area vary greatly with wind speed. Measurements of ambient sound levels were taken near the project on two separate occasions to document existing conditions under a range of wind conditions. Sound levels were measured at locations along Bed Tick Road between 0.5 mile and 1.0 mile south of SH91 (Cold Springs Road) where residences H through K on table 3.6-1 are located. Measurements were also taken at a location approximately 1.5 miles farther east, where there were no identifiable major noise sources nearby and where a swale for a Bed Tick Creek tributary afforded shelter during windy conditions. The equivalent continuous sound levels ( $L_{eq}$ ) measured along Bed Tick Road averaged approximately 33 dBA with little or no wind and were between 45 dBA and 49.9 dBA with moderate winds from the southwest. (A small utility tractor was in use at a horse pasture near one of the residences during part of the moderate wind measurement period and was noted as affecting measured levels to some degree.) Measurements taken with substantially higher wind speeds (estimated at 25 to 30 mph) yielded average  $L_{eq}$  of 61.7 dBA. Under these higher wind speed conditions, wind noise dominated and masked all other sounds in the area.

Sound levels measured at the wind-sheltered location were notably lower than levels in wind-exposed monitoring locations under conditions of moderate to high wind speeds. They were comparable to measured levels at the other monitoring location when there was little to no wind. Measured levels at this location averaged 33.0 dBA with little or no wind. With moderate wind

speeds,  $L_{eq}$  ranged from the low-30s dBA to the mid-40s dBA, averaging 36.8 dBA. (The higher levels measured at this location included noise from an occasional light vehicle passing by on the gravel-surfaced road.)

Table 3.6-2 provides examples of noise levels from several common sources for comparison with the levels measured near the proposed project. Ambient noise levels with low wind speeds, or in wind-sheltered locations, would correspond to “quiet” nighttime conditions in suburban areas. With higher wind speeds, noise levels in the project vicinity would be nearing levels experienced in commercial, high traffic areas.

**Table 3.6-2: Typical Sound Levels of Common Noise Sources**

Sound Pressure Level (dBA)	Common Indoor Noise Levels	Common Outdoor Noise Levels
110	Rock band	--
105	--	Jet flyover at 1,000 feet
100	Inside New York subway train	--
95	--	Gas lawn mower at 3 feet
90	Food blender at 3 feet	--
80	Garbage disposal at 3 feet, or shouting at 3 feet	Noisy urban daytime
70	Vacuum cleaner at 10 feet	Gas lawn mower at 100 feet
65	Normal speech at 3 feet	Commercial area, heavy traffic at 300 feet
60	Large business office	--
50	Dishwasher in next room	Quiet urban daytime
40	Small theater, large conference room	Quiet urban nighttime
35	--	Quiet suburban nighttime
33	Library	--
28	Bedroom at night	--
25	Concert hall (background)	Quiet rural nighttime
15	Broadcast and recording studio	--
5	Threshold of hearing	--

Source: BLM 1999b.

### 3.6.2 Environmental Impacts and Mitigation Measures

#### 3.6.2.1 Issues and Evaluation Criteria

The primary issue is the potential for project-related noises to disturb nearby residences not shielded from the quarry by terrain.

The Proposed Action or Alternative A would have major impacts on noise if project-related noise levels would result in either one of the following at potentially affected receptors.

- noise levels would exceed a day-night average ( $L_{dn}$ ) of 65 dBA.
- noise levels would increase by 10 dBA or more above existing levels.

Noise impacts are commonly judged according to two general criteria: the extent to which a project would exceed federal, state, or local noise regulations, and the estimated degree of

disturbance to people. Noise emissions at the proposed quarry site are governed by the regulations and standards of the Mine Safety and Health Administration (MSHA) and the Occupational Safety and Health Administration (OSHA). These regulations address noise impacts to workers. Adherence to these standards is required, and this analysis assumes the Proposed Action would be in compliance. Consequently, this analysis is focused on potential effects of proposed operation noise on sensitive receptors outside the immediate quarry site, primarily residences in the project vicinity.

Neither the state of Wyoming nor Converse County has noise regulations governing quarrying operations. Without legislative guidance, the degree of disturbance becomes the key factor in evaluating noise effects. The concept of human disturbance is known to vary with a number of interrelated factors, including changes in noise levels, the presence of other non-project related noise sources, peoples' attitudes toward the proposed project, the number of people exposed, and the type of human activity affected (e.g., sleep, quiet conversation, or religious ceremonies as compared to physical work or active recreation).

In the absence of applicable noise regulations or specific standards, the noise analysis used 65 dBA  $L_{dn}$  as an absolute level criterion, and a 10-decibel increase above existing levels as a relative criterion, to evaluate projected project-related noise. The 65-dBA  $L_{dn}$  criterion is based on U.S. Department of Housing and Urban Development (HUD) noise guidelines, which identify levels in excess of 65 dBA  $L_{dn}$  as “normally unacceptable” for exterior noise for residential areas, including rural housing developments (HUD 1996). A 10 dB increase is perceived as a doubling of sound and is considered a likely indicator of community annoyance. The 10-dBA figure is based on EPA studies showing that an increase of 10 dBA over existing background noise levels has commonly caused nearby residents to vigorously complain (EPA 1974).

### *3.6.2.2 No Action Alternative*

The No Action Alternative would result in a continuation of existing noise conditions in the project area for the duration of authorized mining activities. The current quarry site would then be reclaimed, which would result in lower levels of noise emissions from heavy equipment used in the reclamation process. After completion of the reclamation activities, the area would revert to relatively quiet wildlife habitat and cattle grazing activities punctuated by periodic noise from agricultural machinery, primarily from haying.

### *3.6.2.3 Proposed Action*

Rock quarrying operations commonly generate noise from two primary sources: operations of both stationary and mobile heavy equipment, and blasting to break up bedrock into material suitable for crushing. Major sources of noise from the Douglas Quarry Expansion Project would include rock drilling, blasting, loading of rock into the primary crusher, primary and secondary crushing, and transportation of product from the quarry to clients off-site. An equipment roster with noise emissions estimates is illustrated in table 3.6-3. Noise emissions from the current operations were measured on the quarry site. The measurements included a rotary drill, primary and secondary crushers, generators, and front-end loaders. Separate estimates for mobile equipment were developed from published EPA data (EPA 1971), from noise analyses of

previous mining activities using comparable equipment (BLM 2007b), and from file data for prior projects using comparable equipment.

**Table 3.6-3: Douglas Quarry Expansion Project Equipment Noise Levels**

Equipment			Daily Operation		Comments
Type	Units	dB <sup>A</sup> <sup>1,2</sup>	Hours	Use Factor	
Rotary Drill	1	83	10	.417	1 week per month
Front End Loader (5-cubic-yard)	3	80	15	.625	
Crawler Tractor (225 hp)	1	85	8	.333	
Track-hoe (4-cubic-yard bucket or impact hammer)	1	77	10	.417	
Water Truck	1	75	2	.083	
Lighting Plant	3	78	10	.417	
Misc. Site Maintenance Equipment and Vehicles	-	70-85	4	.167	
Crushing and Sizing Equipment	1	87	15	.625	

<sup>1</sup> Sound pressure levels (SPL) measured at a reference distance of 50 feet (see Glossary).  
<sup>2</sup> SPL per unit.  
**Sources:** Pinnacle 2010; EPA 1971; BLM 2007b.

Duty schedules were estimated by Pinnacle for the major equipment on the quarry site (table 3.6-3). For purposes of the analysis, it was assumed that the maximum equipment usage, typically operating at one time during the day, would include the crushing and sizing equipment, a track hoe, three front end loaders, and a crawler tractor. Approximately one week of each month, a rotary drill would be added to the mix in preparation for the once monthly blasting. According to the proposed project description, major quarry operations would occur between 7:00am and 10:00pm. Drilling, blasting, and rock hammer operations would only occur during daylight hours. Trucking of products would take place between 6:00am and 6:00pm. Nighttime activities would be limited to maintenance and repair efforts, which would be notably quieter than daytime quarry operations since the crusher and screening equipment would not be operating. Based on this scenario, noise emissions at the quarry during the day would be approximately 87.5 dBA at a 50-foot reference distance without the drill operating and 88.1 dBA with the rotary drill in operation. (Note that the decibel scale is logarithmic so adding an additional source does not result in a simple addition of decibels.) Nighttime noise emissions at the quarry would be much lower, likely at or below 80 dBA at the 50-foot reference distance. Calculating the day-night average ( $L_{dn}$ ) sound pressure level involves adjusting the noise emissions for each type of equipment based on the applicable usage factors noted in table 3.6-3. With the adjustments included, the worst case  $L_{dn}$  would be 88.6 dBA without the drill operating and 88.9 dBA with the drill operating.

A series of noise measurements were taken near the north edge of the quarry pit with a full complement of equipment in operation. The measured noise levels were consistent with the calculated levels, providing verification of the calculation procedures.

Table 3.6-4 presents noise levels at the nearby residences resulting from the anticipated noise emissions for the Proposed Action. As shown in the table, day-night average quarry noise levels at the residences would range from 33.1 dBA to somewhat less than 42.2 dBA. Consequently, quarry noise would not exceed the 65-dBA HUD  $L_{dn}$  standard at any of the residences. The

levels illustrated in the table are based on noise attenuation from distance and atmospheric absorption only. Noise levels at residence A through G and L would actually be lower because these locations would also benefit from topographic barrier effects.

**Table 3.6-4: Noise Levels from the Proposed Action at Sensitive Receptors<sup>1</sup>**

Residence <sup>2</sup>	Daytime <sup>3</sup> Noise (L <sub>d</sub> )	Nighttime Noise (L <sub>n</sub> )	Day-Night Average Noise (L <sub>dn</sub> )
A	33.4	25.9	34.5
B	32.2	24.7	33.3
C	32.0	24.5	33.1
D	32.7	25.2	33.8
E	34.0	26.5	35.1
F	33.9	26.4	35.0
G	33.5	26.0	34.6
H	36.5	29.0	37.6
I	37.2	29.7	38.3
J	37.7	30.2	38.8
K	37.1	29.6	38.2
L	41.1	33.6	42.2

<sup>1</sup>Based on spreading attenuation and atmospheric attenuation only.  
<sup>2</sup>Terrain barriers would reduce levels at residences A through G and L to varying degrees.  
<sup>3</sup>Assumes rotary drill not operating; levels would be 0.6 dBA higher with drill noise.

Although the issue of level of increase over existing noise levels is somewhat more complex due to the variability of ambient noise levels depending on wind conditions, the results are similar. When there is little or no wind, current noise levels are approximately 33 dBA. Project-related daytime noise levels at the residences would range from 32.0 dBA to 41.1 dBA, and day-night average noise levels would range from 33.1 dBA to 42.2 dBA. All of these levels would be below the 10-dBA increase threshold. Levels at the four residences with direct line of sight to the quarry (H through K with no intervening terrain barriers) would range from 36.5 dBA to 37.7 dBA daytime and 37.6 dBA to 38.8 dBA day-night average. At these levels, with little or no wind, quarry operations would be audible, but not obtrusive or dominant at the residences. On occasions with moderate to high winds, quarry operations would be barely audible, if at all. Consequently, the Proposed Action would not exceed the 10-decibel over existing noise levels threshold.

Blasting noise is not included in the noise level estimates noted above, mainly because mine blasting is typically an extremely brief event, which would only occur approximately once per month under the Proposed Action. With this very brief and occasional type of noise emission, neither of the criteria noted for other project-related noise is relevant to blasting noise. Blasting for the proposed project would take place only during daylight hours and would be conducted under strict MSHA safety procedures.

Information on noise emissions from blasting is inconsistent and field measurements of blasting noise at the existing quarry are not available. File data from field measurements and subjective

observations at other, larger mine sites indicate maximum noise emissions from blasting could be approximately 116 dBA or less at a 50-foot reference distance. This level of maximum noise would be equivalent to approximately 73 dBA at the 4 Bed Tick Road residences (H through K) and lower at other area residences. Considering the scale of the Douglas Quarry, actual noise levels from blasting may be somewhat lower. With modern blasting techniques, blast noise would be experienced by people at the sensitive receptors as a brief, somewhat muted clap and roll of thunder preceded by a warning whistle or siren. Considering the month-long time lapse between blasting events, there may be a modest “startle factor” for area residents from blasting on occasion.

A final noise consideration for the Proposed Action would be noise from trucking of aggregate out of the site. At the proposed production level of 1,000,000 tons per year, there would be an average of 125 loaded trucks departing the site and 125 empty trucks entering the site for a total of 250 truck trips per day on SH91. Truck traffic would occur over a 12-hour period between 6:00am and 6:00pm. The nearest noise sensitive receptors to SH91, as shown on figure 3.6-1 and table 3.6-1, are residences E, F and G, which are each approximately 250 feet from the highway. Based on measurements of noise from trucks entering and exiting the project site, average  $L_{eq}$  noise levels from this trucking activity would be 32.9 dBA at the residences. Because there would be no nighttime shipping, the  $L_{dn}$  level is not relevant, but the calculated noise level would be well below the 65 dBA absolute threshold. Existing background noise was measured at 31.3 dBA near the three residences at the time the truck noise was measured so the average project-related increase over existing levels would be very small, well below the 10-dBA criterion. All three of the residences do benefit from a small degree of noise reduction from terrain barriers, but only residence G has a complete line-of-sight barrier that would afford it some additional reduction in noise from trucking.

During peak production, there would be 188 loaded trucks departing the project site and 188 empties entering the site for a total of 376 truck trips per day. Average  $L_{eq}$  noise levels from trucking at peak production would be 34.5 dBA at the three nearest residences. Although slightly higher than the level for average production, this level would not exceed either the 65-dBA absolute evaluation criterion or the 10-dBA increase over existing levels criterion.

Day-night average sound is a calculated level based on not only the actual sound levels, but also the length of time each day the sound is at a given level and the time of day that the levels occur. A calculated penalty is added to each actual sound level that occurs between the hours of 10:00pm and 7:00am. A more readily understandable concept of noise is simply the measured sound level. The typical heavy truck operating from the existing quarry emitted maximum noise levels of approximately 76 dBA measured at a distance of 50 feet from the moving vehicle. At this level, noise experienced at the two residences approximately 250 feet from the roadway would be approximately 62 dBA. This was the maximum level measured, however, which occurred for only a few brief seconds as the truck passed by. About half of the trucks would generate this level of noise (the loaded ones accelerating from the site entrance eastbound on SH91). The returning empty trucks would be slightly quieter as they slow to enter the project site, assuming engine brake use is not permitted in the area.

In conclusion, noise from the Proposed Action, including noise from product trucking, would increase noise levels at some sensitive receptors only very slightly during periods when wind

speeds are very low. The adverse effect on residences in the area would be relatively minor. These would be short-term, direct effects, occurring only during the life of the Proposed Action (five years plus one year of reclamation). There would be no residual noise effects, and after completion of the project and reclamation, all noise from the Proposed Action would cease.

#### 3.6.2.4 *Alternative A*

Under Alternative A, the key differences from the Proposed Action would be a reduction in total production from 1,000,000 tons per year to 280,000 tons per year, a reduction in maximum operating hours from 15 per day to 10 per day, and a reduction in days of operation from 345 per year to 250 per year. The reduced production levels would reduce the average truck traffic to approximately 100 trips per day and a peak truck traffic level to 140 trips per day.

Noise emissions from the quarry under Alternative A would be the same as under the Proposed Action except that reduced operating hours would reduce the hours of noise emissions per day, which would be slightly more beneficial to residences H through K. Noise levels during operation would be the same as for the Proposed Action, however. The reduction in hours of operation would reduce day-night average noise levels from quarry operations very slightly. As for the Proposed Action, quarry-related noise levels under Alternative A would be well below the 65-dBA standard for  $L_{dn}$  noted above.

The levels of increase over existing noise levels would be the same as described for the Proposed Action during daytime hours. There would be no measurable nighttime increase over existing noise levels at the local residences under Alternative A.

Blasting noise effects would be the same as described for the Proposed Action.

With reduced peak production, the maximum of 140 truck trips per day would generate a daytime average noise level of 34.2 dBA at residences E, F, and G, which would not exceed either of the evaluation criteria. Average production under Alternative A would require about 100 truck trips per day, which would generate average  $L_{eq}$  noise levels at 29.6 dBA at the three nearest residences. Both levels would be very slightly lower than trucking noise levels under the Proposed Action.

The day-night average noise levels from the Proposed Action would not exceed either the 65 dBA threshold of the first evaluation criterion at the residential sensitive receptors, nor the 10 dBA noise level increase over existing noise levels threshold of the second criterion. In conclusion, noise level increases for Alternative A would be lower than for the Proposed Action, but would still create relatively minor adverse effects at several residences during periods of low wind. These would be relatively long-term effects since mining would occur over a 16-year period with Alternative A. At the completion of mining and reclamation (1 year more after mining), there would be no residual noise effects and all noise from Alternative A would cease.

#### 3.6.2.5 *Mitigation Measures*

No mitigation measures would be required for noise effects.

While blasting noise would not be excessively loud, due in part to the short duration of blasting noise, it would minimize the “startle factor” for nearby residents to notify them in advance of anticipated blasting times. This mitigation recommendation would be applicable to both the Proposed Action and Alternative A.

### **3.7 Mineral Resources**

#### **3.7.1 Affected Environment**

Bedrock, rock outcrops, regolith, cobbles, gravels and coarse soils characterize much of the western portion of the proposed project area. A light gray silty clay loam formed from a residuum of sandstone, siltstone, and limestone occurs on the finger ridges, with sandy loams, sands, and poorly sorted gravels formed from alluvium along eastern portions of the ephemeral drainages (Lageson and Spearing 1988; Love and Christiansen 1985).

Exploratory drilling and surface investigations indicate that the proposed quarry expansion area contains approximately 4.6 million tons of construction aggregate materials (e.g., sand and gravel, limestone, and quartzite). The construction aggregates are suitable for road base construction, concrete, asphalt, and riprap for drainage control structures.

#### **3.7.2 Environmental Impacts and Mitigation Measures**

Existing mineral materials would be removed from the quarry expansion area in conjunction with the proposed mining operations. The quantities of mineral material removed would be dependent upon the selected project alternative as discussed below.

##### **3.7.2.1 Issues and Evaluation Criteria**

The following criteria were used to determine the level of impacts to mineral resources:

- conflicts which could interfere with the recovery of other minerals;
- an unmanageable change to the existing geology; and,
- geological changes that would impact the health and safety of the environment.

##### **3.7.2.2 No Action Alternative**

Under the No Action Alternative, no mineral sale would occur, and there would be no quarry expansion or additional extraction of mineral materials.

##### **3.7.2.3 Proposed Action**

Under the Proposed Action, an additional 4.6 million tons of limestone and quartzite rock would be excavated from the DQEP area over the life of mine. Based on the reclamation plan for the

final pit configuration, there would be no unmanageable change to existing geology, and geological changes would not affect the health and safety of the environment. At this time, there are no other known deposits of other commercial mineral materials (resources) within the proposed DQEP area that would be affected by the Proposed Action.

#### 3.7.2.4 Alternative A

Potential impacts to mineral resources under Alternative A would be identical to those described under the Proposed Action. The only difference between Alternative A and the Proposed Action is the mining duration required to extract 4.6 million tons of aggregate mineral materials.

#### 3.7.2.5 Mitigation Measures

No mitigation measures are required for mineral resources.

### **3.8 Groundwater and Surface Water Resources**

#### 3.8.1 Affected Environment

##### 3.8.1.1 Surface Water Resources

The proposed project is located in the Bed Tick Creek watershed, which is tributary to the North Platte River. The watershed area is 14,100 acres (approximately 22 square miles) and includes Little Bed Tick Creek, located to the north of the main stem of Bed Tick Creek. The watershed area of the main stem of Bed Tick Creek, without Little Bed Tick Creek, is 8,960 acres (approximately 14 square miles). An unnamed, well-defined ephemeral tributary to Bed Tick Creek drains the DQEP area. The confluence of the tributary and Bed Tick Creek is approximately 0.5 mile north of the proposed quarry site (NRCS 2011). The upper reaches of Bed Tick Creek, where the proposed project area is located, are dry except during periods of heavy spring runoff or intense local precipitation events. The reach of Bed Tick Creek near the proposed project is not in a designated flood hazard zone. FEMA (Federal Emergency Management Agency) maps indicate that the designated flood hazard zone on Bed Tick Creek begins approximately 2 miles downstream of the project area.

Two small stock ponds, located approximately 400 feet and 700 feet downstream of the proposed project site, are within the unnamed tributary to Bed Tick Creek. These stock ponds are fed by precipitation runoff from the proposed project area and currently serve as sediment containment structures for surface drainage from the quarry site. Surface water at the quarry is managed with a system of diversions and collection ditches (or berms) that route runoff to the quarry pit. The quarry pit is the natural low point of the affected area. Three rock check dams and a small stock pond arranged along the drainage control suspended solids from runoff.

Fuel storage at the project site is located next to the facilities and within a lined containment berm. Spill clean-up equipment and sorbent booms are available at this location.

Records from the Wyoming State Engineers Office show three adjudicated<sup>2</sup> surface water rights within an approximate 1-mile radius of the current quarry site (WSEO 2011a). Location of surface water rights (shown using the legal description as a quarter, quarter of a section) are shown in figure 3.8-1 and details are provided in table 3.8-1.

**Table 3.8-1: Adjudicated Surface Water Rights within 1 Mile of the DQEP Area**

WR Number	Priority Date	Facility Name	Uses	T	R	Section	Qtr, Qtr	Total Flow (cfs or af storage) <sup>1</sup>
P18365.0D	03/05/1934	Brockway No. 2 Ditch	Irrigation, Stock Watering	32 N	72 W	29	SE ¼, SE ¼	0.67 cfs
P9876.0S (CR CR11/063)	02/04/1986	Gedney No. 10 Stock Reservoir	Storage	32 N	72 W	33	SE ¼, NW ¼	11.65 af
P803.0S (CR CR02/168)	04/23/1954	Isolated No. 1 Stock Reservoir	Storage	32 N	72 W	34	NE ¼, SW ¼	8.66 af

<sup>1</sup>cfs = cubic feet per second; af = acre-feet.

There are no site-specific water quality data available from the proposed project area. Bed Tick Creek is a class 3B drainage (WDEQ/WQD 2001). The 2010 Integrated Water Quality Assessment (WDEQ/WQD 2010) does not list either Bed Tick Creek or the segment of the North Platte River at, or below the confluence with Bed Tick Creek on the 305(b) or 303(d) lists.

3.8.1.2 *Groundwater Resources*

Four permitted water wells are located within 1 mile of the DQEP area (figure 3.8.1). Table 3.8-2 displays WSEO water rights permit information for these wells (WSEO 2011). The Huxtable #2 was enlarged by permit 192847 (Enlarged Huxtable #2). There was no physical enlargement of this well. The combined volume of water permitted under the enlargement is 50 gpm (1,679,000 gallons or 5.1 AF per year). A temporary water use agreement between Huxtable and Pinnacle allows the use of the Enlarged Huxtable #2 well for the existing operation of the Douglas Quarry. Water pumped from the well is used for dust abatement in the crushing operation and along access roads. Current annual water use from the Enlarged Huxtable #2 is approximately 2.2 AF per year. The well is located within an area that is hydrologically connected to the Platte River system (WSEO 2004).

Projects that result in consumptive water use in the Platte River Basin in Wyoming must be evaluated to determine whether a PRRIP is required. The WSEO determines the hydrological connection to the Platte River Basin and if the water use is new or from an existing source. The WSEO had previously approved a water use of 2.2 AF per year covered under Wyoming’s depletions plan. A letter from the WSEO dated May 2, 2011 stated that an increase in the existing water use from 2.2 AF per year to approximately 5.1 AF per year resulted in an increase of 2.9 AF per year that was not covered by the PRRIP. The increase of 2.9 AF per year is a new

<sup>2</sup> Adjudicated water rights are those rights that are approved by the Wyoming State Engineer’s Office.

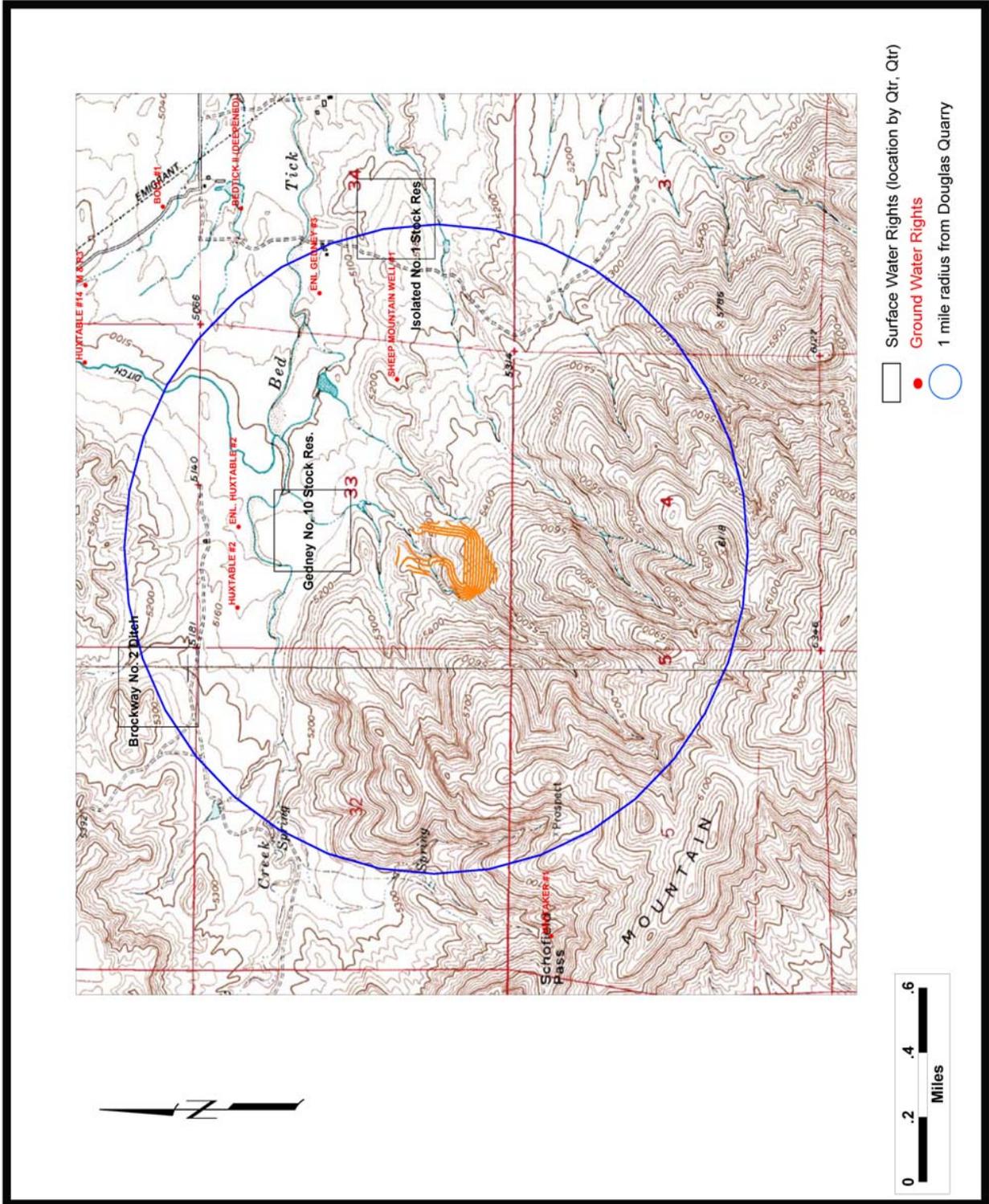


Figure 3.8-1: Water Rights within 1 Mile of the Douglas Quarry

**Table 3.8-2: Groundwater Rights within 1 Mile of the DQEP Area**

WR Number	Status <sup>1</sup>	Priority Date	Facility Name	Uses	T	R	Sec	Qtr, Qtr	Actual Yield (gpm)	Total Depth (ft)	Static Water Level (ft)
P192847W	GSI	09/02/2005	Enlarged Huxtable #2	Misc.	32 N	72 W	33	NE ¼, NW¼	50; 25 from Enl. + 25 from original permit #80219	160	
P97415W	UNA	04/17/1990	Sheep Mountain Well #1	Misc., Municipal	32 N	72 W	33	NE ¼, SE¼	910	1165	365
P70305W	GST	5/28/1985	Enlarged Gedney #3	Stock Watering	32 N	72 W	34	SW¼ NW¼	20	120	30

<sup>1</sup>GSI – Good standing incomplete indicates that all legally required notices have not been received and permit has not expired.  
 GST – Good standing pending receipt of legally required notices.  
 UNA – Unadjudicated water right

water-related activity that is covered under Wyoming's depletions plan. Because the water use is temporary, no mitigation is necessary, and a Platte River recovery agreement is not needed (WSEO 2011b).

There is no site-specific groundwater quality data available from the proposed project area. The existing quarry operation has not intersected the groundwater table. The base of the quarry pit is thought to be at least 20 feet above the closest aquifer (Pinnacle 2010). Groundwater has not accumulated in the quarry pit and dewatering has not been required. The elevation of the quarry pit is higher than the elevation of the valley floor where the existing source well is located and will remain above any known groundwater sources.

### 3.8.2 Environmental Impacts and Mitigation Measures

#### 3.8.2.1 Issues and Evaluation Criteria

Impacts to surface water and groundwater would be major if:

- quantity of stream flows decreases so that it adversely affects established users;
- existing surface water quality is degraded so that it no longer meets state and/or federal water quality standards;
- water yields from existing wells or springs are reduced from the water consumption required for the project; and,
- existing groundwater quality is degraded so that it no longer meets state and/or federal water quality standards.

#### 3.8.2.2 No Action Alternative

Under the No Action Alternative, production from the existing mine would continue until the contracted amount of broken and crushed aggregate is depleted. The current water use under this contract is 4,200 gpd for 169 days from the Enlarged Huxtable #2 well.

Direct and indirect impacts to surface water from surface disturbance are currently mitigated with the implementation of the SWPPP. These measures include the following.

- Fuel storage is located within a lined containment berm to hold any spills that may occur during equipment fueling.
- Fueling locations are equipped with clean up equipment and sorbent booms to contain any spills.
- The use of two dry stock ponds located below the quarry pit as sediment containment structures.

- Rock-check dams that have been placed throughout the project area.
- Cleared and graded soils have been sloped to the sedimentation ponds.
- Stormwater is controlled along the access road by the use of berms, ditches, and culverts.

The current mining activities have negligible short- and long- term adverse impacts to the quantity and quality of surface water and groundwater resources. These activities would cease in once existing negotiated sales are depleted, unless a new minerals contract is approved by the BLM.

### 3.8.2.3 Proposed Action

#### **Surface Water Resources**

The Proposed Action would not use or consume surface water, so the impact to the quantity of surface water flows would be negligible. Direct, short-term impacts to surface water quality could result from accidental spills of petroleum products, hydraulic fluids, or antifreeze. The potential for spill would be negligible, as refueling would take place in a lined containment area that is not adjacent surface water sources, and mitigation measures outlined in the SWPPP would be followed.

Indirect impacts to surface water quality from sedimentation caused by the mining operation would also be mitigated as outlined in the SWPPP. Established best management practices (BMPs) would continue to be used to slow runoff and direct flow to the sediment containment structures. This would preclude indirect impacts to surface water quality of Bed Tick Creek, its tributaries, or the North Platte River. The direct and indirect impacts to surface water quality from the Proposed Action would be negligible.

#### **Groundwater Resources**

Groundwater would continue to be used for dust control for the quarrying, crushing activities, and on access roads. The source of water for dust abatement will be the Enlarged Huxtable #2 well (source well). The quantity required for the Proposed Action is approximately 4.6 AF per year. An average daily water use for dust abatement would be 5,800 gpd for 260 days. Life of mine under the Proposed Action is five years.

The temporary water use permit issued by the WSEO that allows Pinnacle to use the source well is being updated to reflect the increased water production from 2.2 AF per year to 5.1 AF per year (the permitted amount), which would be sufficient to cover Pinnacle's projected use of 4.6 AF per year. The WSEO has determined that the increase in water use of 2.9 AF per year is considered a new water-related activity that is also covered under Wyoming's depletions plan. Therefore, a Platte River recovery agreement is not necessary since the depletions are covered by the state of Wyoming due to the temporary status of this activity.

The permit for this groundwater right allows a maximum instantaneous flow of 50 gpm, which includes the amount from the original permit and the enlargement. The maximum volumetric quantity of water allowed per year is 1,679,000 gpy or approximately 5.1 AF.

The Sheep Mountain well, owned by the city of Douglas, Wyoming (City), is located in the NE ¼ of the SE ¼ of section 33, T. 32 N., R. 72 W. The well is 1,165 feet deep and is permitted for a maximum instantaneous flow of 910 gpm (table 3.8-2). The surface elevation of the well is approximately the same as the quarry floor elevation (figure 3.8-1). The elevation of water in the well is about 365 feet below the lowest elevation in the quarry.

The Sheep Mountain well is located along an east-west trending fault that appears to be a possible low flow boundary. The source well is located on the north side of the fault and the Sheep Mountain well is on the south side. The effect of the fault on the hydrologic connection between the wells is unclear. However, the water level elevation of the source level is estimated at approximately 260 feet above the water level elevation of the Sheep Mountain well, indicating that there is not a significant hydrologic connection between the wells.

The City is concerned about the potential for adverse water quality impacts to the Sheep Mountain well from mining operations and has proposed mitigation and monitoring measures. These measures have been incorporated into the recommended mitigation and monitoring measures for the Proposed Action and alternatives.

Two groundwater monitoring wells down gradient of the quarry would be used to determine water level and water quality. The source well would be used as one of the monitoring wells and a second well would be drilled immediately north of the quarry operation along the access road at the north section line of section 33, T. 32 N., R. 72 W.

Monitoring for the following parameters would be performed annually in September:

- water level;
- total dissolved solids (TDS);
- total suspended solids (TSS);
- turbidity;
- ammonium;
- ammonia;
- nitrite; and,
- total kjeldahl nitrogen (TKN)

The Proposed Action would use the source well for dust abatement in accordance with the water use permit issued by the WSEO. Direct, short-term adverse impacts to water yields of existing wells or springs from the water consumption required for the project would be minor. Water use for this project would return to previous uses for stock watering after the completion of the quarry operation, so long-term adverse impacts to nearby wells would be negligible.

#### 3.8.2.4 Alternative A

Mine progression under Alternative A is slower extending the life of mine to 16 years. The water use under this alternative is reduced on an annual basis, but the volume of water required over the life of mine remains the same as the Proposed Action. Average daily water use is reduced to 2,200 gpd for 190 days per year. The water use per year is reduced to 1.3 AF. The level of impacts to groundwater with Alternative A would be similar to those described under the Proposed Action.

#### 3.8.2.5 Mitigation Measures

No additional mitigation for air quality is required beyond the applicant-committed mitigation measures listed in section 2.1.5.

### **3.9 Soils**

#### 3.9.1 Affected Environment

The Natural Resources Conservation Service (Kee 2008) mapped the dominant soils located within the proposed quarry expansion area as the Tyzak-Rock outcrop complex, 6 to 70 percent slopes. In this map unit, both the Tyzak and rock outcrop components make up about 45 percent of the delineation. The Tyzak soil is typically shallow to bedrock (10 to 20 inches) exhibiting very channery loam textures, a high profile coarse fragment content, and a surface cover of 25 percent rock fragments. It is well drained with a very low water holding capacity. The runoff potential is very high. This soil is non-saline and non-sodic with pH values ranging from 7.9 to 8.4. The rock outcrop part of this unit is typically interspersed with the Tyzak soil forming a mosaic and is characterized by a very high runoff potential.

On-site soil mapping and descriptive work was completed to aid in reclamation planning and soil salvage/replacement (Pinnacle 2010). The majority of the proposed expansion area is dominated by rock outcrop with intermittent soil deposits from 1 to 3 inches deep. Localized areas of Entisols were also identified exhibiting soil depths less than 3 inches to bedrock. The rock outcrop-dominated acreage and the shallow Entisols are not considered suitable for salvage due to shallow soil depths and the presence of bedrock resulting in low salvage efficiencies and limited soil availability. Conversely, the Tyzak soil was found within the permit area at four locations having soil depths ranging from 12 to 22 inches. These deeper soils are characterized by more shallow slopes and a reduced rock outcrop presence. The deeper Tyzak soils are available for opportunistic soil salvage.

#### 3.9.2 Environmental Impacts and Mitigation Measures

##### 3.9.2.1 Issues and Evaluation Criteria

Impacts to soils resulting from project operations would be considered major if either of the following would occur.

- All topsoil and suitable subsoil resources are not salvaged and used for reclamation, as required by the WDEQ/LQD, and suitable maintenance activities are not performed to maintain stockpile stability and prevent undue loss of topsoil and subsoil resources.
- Disturbed areas are not configured to be stable over time and prevent undue erosion. Reclaimed and revegetated portions would not meet WDEQ/LQD standards, and vegetative cover would not be adequate to meet the post-mining land uses of wildlife habitat and livestock grazing.

### 3.9.2.2 No Action Alternative

Under the No Action Alternative, there would be no expansion of the existing quarry. No additional direct or indirect impacts to soils would occur. Soil productivity would remain at current levels and soil erosion would continue to occur at natural rates. Existing disturbed sites would be reclaimed as described in the Huxtable Quarry EA (BLM 2005) and the existing mine permit application on file with the WDEQ/LQD.

### 3.9.2.3 Proposed Action

Soil salvage is not possible over much of the DQEP area because of the presence of rock outcrops and surface rock cover. In other areas where some soil resources are present, slope angle and operational limitations of salvage equipment preclude their salvage. As a result, some available soils would not be salvaged and would be irretrievably lost.

Soils that are available for salvage would be subject to both chemical and physical impacts during salvage, stockpiling, and revegetation. During soil handling activities from salvage through revegetation, the affected soil horizons would be mixed. The soils available for salvage are non-acidic, non-saline and non-sodic throughout their profiles. The primary soil for salvage is the Tyzak soil, which exhibits a high profile coarse fragment content. Other soils, which may be salvaged in lesser quantities, exhibit soil textures having few profile coarse fragments. Profile mixing would either maintain or reduce the dominance of coarse fragments. A reduction in coarse fragment content would increase available water holding capacity. Therefore, horizon mixing would not negatively affect soil suitability for reclamation. Soil compaction could occur during soil stockpiling and reapplication. The proponent has committed to eliminate compaction following soil reapplication thereby reducing this potential impact. Soils would unavoidably be subject to erosion during the soil handling sequence. The proponent has committed to stabilizing the soil stockpiles created and mulching the re-soiled/reseeded areas thereby properly addressing this potential impact. Soil productivity of salvaged soils would essentially be lost until revegetation is successful.

Because of soil stockpiling, soils may undergo minor chemical changes and a loss of soil microflora. Given the short time soils will be stockpiled, small area associated with revegetation, and the natural potential for invasion of microflora from adjacent sites, this potential impact is considered negligible. However, prior to re-spreading stockpiled topsoil, representative samples of topsoil would be sent to a soils laboratory to evaluate fertility and the need for soil amendments to ensure revegetation success. Soil amendments and other soil mitigation measures would be applied as necessary to ensure reclamation success.

The potential for increased erosion would be minimized as described in the SWPP and under the “Applicant-Committed Mitigation Measures” (section 2.1.5) for surface and groundwater. In addition, soil stockpiles would be bermed and seeded to stabilize the stockpiles and prevent undue loss of topsoil.

Soils that cannot be salvaged prior to mining will be not be available for replacement resulting in a loss of soil productivity across a major portion of the proposed disturbed area. This represents a direct, adverse, long-term impact. Given the limited acreage involved, this is considered a relatively minor impact since no topsoil replacement would be required for the rock walls to remain after cessation of mining and completion of reclamation activities. In addition, much of the existing areas proposed for disturbance support limited soils resources as described in the “Affected Environment” for soils (section 3.9.1).

According to table 5, *Topsoil Mass Balance*, in the mine permit application (November 2010) submitted to WDEQ/LQD, approximately 6,000 cubic yards of topsoil would be available for salvage and re-spreading for reclamation. Based on the mine permit application submitted to the WDEQ/LQD, it is estimated that salvaged topsoil would be sufficient to cover approximately 6.5 acres of benches proposed for revegetation to a depth of approximately 7 inches. Soils to be salvaged would be protected from compaction and detrimental erosion by the mitigation techniques proposed by Pinnacle and WDEQ/LQD requirements. Therefore, impacts to salvageable soils would be direct, short-term (following replacement), and minor to moderate, and as long as WDEQ/LQD requirements and standards are met, impacts to soils would not be major.

#### 3.9.2.4 Alternative A

Impacts to the soil resource would be the same as those for the Proposed Action in terms of the soils impacted. However, given the shift in production timing (16 years versus five years), the impacts would occur over a longer time than the Proposed Action. Erosion from stockpiled soils would be greater than the other action alternatives because of the additional length of time topsoil stockpiles would be in place prior to re-spreading. This increase in erosion would be comparatively negligible given the Pinnacle’s commitment to stabilizing soil stockpiles as well as WDEQ/LQD requirements.

#### 3.9.2.5 Mitigation Measures

Because topsoil salvage would be opportunistic and topsoil salvage volumes are somewhat uncertain, it is recommended at the conclusion of soil salvage operations that the actual volume of topsoil and suitable subsoil present in the soil stockpiles be calculated. The acreage to be re-soiled could then be accurately calculated as a function of the soil volume available. When calculating the acreage to be re-soiled, the characteristics of the soil and the success of previous revegetation efforts need to be considered in order to determine the depth soil materials need be spread to achieve successful revegetation.

No additional mitigation or monitoring activities are recommended beyond those committed to by Pinnacle and required by the WDEQ/LQD.

### 3.10 Upland Vegetation

#### 3.10.1 Affected Environment

Three vegetation community types have been identified within the pit expansion project area (BLM 2005; Pinnacle 2010). The shrub/juniper community is supported across approximately 85 percent of the proposed quarry expansion area. Species occurring in this community include mountain mahogany (*Cercocarpus montanus*), snowberry (*Symphoricarpos albus*), antelope bitterbrush (*Pursia tridentata*), rubber rabbitbrush (*Ericameria nauseosus*), Wyoming big sagebrush (*Artemisia tridentatum* var. *wyomingensis*), silver sagebrush (*Artemisia canum*), and fringed sagebrush (*Artemisia frigida*). Juniper (*Juniperus* sp.) trees are interspersed across this community. Typical understory species include bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), needle-and-thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), cheatgrass (*Bromus tectorum*), and various forb species. The soil map unit supporting this community is the Tyzak-Rock outcrop complex, 6 to 70 percent slopes (Kee 2008).

The remaining approximate 15 percent of the expansion area supports the mountain mahogany community and the shrub steppe community. The former community is similar in vegetation composition to the shrub/juniper community but with a more dense concentration of mountain mahogany supported by shallow soils with a high profile coarse fragment content. Understory species include creeping red fescue (*Festuca rubra*), intermediate wheatgrass (*Thinopyrum intermedium*), sand dropseed (*Sporobolus cryptandrus*), and yellow alyssum (*Alyssum* sp.). The shrub steppe community occurs on deeper soils (Tyzak series) and supports Wyoming big sagebrush, fringed sagebrush, and silver sagebrush. The understory is dominated by needle-and-thread, pubescent wheatgrass, prairie junegrass, Idaho fescue, creeping red fescue, wildrye (*Elymus* sp.), western yarrow (*Achillea lanulosa*), and other forb species.

#### 3.10.2 Environmental Impacts and Mitigation Measures

##### 3.10.2.1 Issues and Evaluation Criteria

Impacts to native vegetation within the proposed expansion area would be considered major if either of the following were to occur.

- Disturbed areas are not configured to be stable over time and prevent undue erosion. Reclamation and revegetated portions do not meet WDEQ/LQD standards, and vegetative cover would be inadequate to meet the post-mining land uses of wildlife habitat and livestock grazing.
- A “may affect” determination was reached by the cooperating agencies for any plant species currently listed as either “threatened or endangered” under the *Endangered Species Act* (ESA).

### 3.10.2.2 No Action Alternative

The proposed quarry expansion would not occur under the No Action Alternative. Therefore, no direct or indirect impacts would occur to the vegetation resource in the expansion area because of this proposed project. The existing quarry disturbance would be reclaimed to the extent practicable as described in the Huxtable Quarry EA (BLM 2005), and vegetation communities would continue to develop, in terms of cover, diversity, and production, in response to natural environmental and climatic variables.

### 3.10.2.3 Proposed Action

Direct impacts to the vegetation resource would occur from the elimination of vegetation prior to soil salvage and quarrying of the proposed expansion area. Vegetation removal would occur on a planned annual basis over a five-year period in advance of the quarrying operations. Therefore, vegetation productivity (forage production) losses would also occur over this period with productivity losses increasing through time until mining year six when the boundaries of the proposed 36-acre disturbance are reached. There would be a long-term loss of forage production of approximately 83 percent of the 34-acre pit associated with the rock faces and talus slopes that would not be revegetated. This loss of vegetation productivity would be relatively minor in a regional and local context because of the relatively small area (remaining pit walls and talus slopes; about 31.5 acres) that would not be revegetated in comparison to the extent of similar existing vegetation communities in the Sheep Mountain area.

The project area does not support suitable habitat for any federally recognized threatened or endangered species. No riparian or wetland plant communities are located within the proposed expansion area.

The establishment of invasive non-native species is a potential impact that could result from the proposed quarrying operations. However, the Pinnacle has committed to controlling this impact through a reclamation plan and weed control program submitted as a portion of the mine permit application to WDEQ/LQD.

In conclusion, there would be some long-term loss of vegetation productivity on areas of rock outcrop and talus slopes that would not be revegetated, but this impact would be relatively minor in relation to the available extent of similar vegetation communities in the Sheep Mountain region. In addition, the Proposed Action would not have any effect on threatened or endangered species or result in establishment of large stands of noxious weeds with successful reclamation and the implementation of the proposed weed control plan. Finally, successful reclamation and stabilization of disturbed ground surfaces would have to be achieved to meet WDEQ/LQD standards.

### 3.10.2.4 Alternative A

Under Alternative A, quarrying operations would occur over a longer time span, 16 years versus five years, although the same vegetation types and acreage would be impacted. Therefore, the vegetation communities to be impacted would remain in production for a comparatively longer time before disturbance under this alternative. The differences in vegetation community

production between short-term and long-term impacts associated with the Proposed Action and Alternative A would be relatively minor in a local and regional context.

### 3.10.2.5 Mitigation Measures

No mitigation measures are required beyond the reclamation plan presented in the mine permit application approved by the WDEQ/LQD.

## 3.11 Wildlife

### 3.11.1 Affected Environment

Principal wildlife concerns associated with the DQEP area are potential impacts to important big game winter ranges, raptor nest sites, and breeding migratory birds.

#### 3.11.1.1 Big Game

Mule deer (*Odocoileus hemionus*) is the primary big game species found in the DQEP area, which is included within the south Converse herd unit (hunt area 65). This herd unit has a post-hunting season population objective of 16,000 animals. The 2009 post-season population was estimated to be 7,696 animals, 52 percent below the population objective. The herd has been in decline over the past 10 years with the decline attributed primarily to a reduction in forage production (due primarily to fire suppression), a recent period of severe drought, and chronic wasting disease (WGFD 2010). The proposed quarry expansion is located within an area designated as crucial winter/yearlong range for mule deer (WGFD 2003).

Both pronghorn (*Antilocapra americana*) and elk (*Cervus elaphus*) are known to use the proposed expansion area. Other big game species that may occur in the surrounding region where suitable habitat exists include Rocky Mountain bighorn sheep (*Ovis canadensis*) and white-tailed deer (*Odocoileus virginianus*). The DQEP area is not within any WGFD-designated crucial winter range or other important seasonal habitats for any of these species.

#### 3.11.1.2 Raptors

The proposed project area is within the breeding range of a number of raptor species including golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), and great horned owl (*Bubo virginianus*). Suitable nesting habitat is limited near the project area and is restricted to potential tree nest sites along Bed Tick Creek. Potential cliff nesting habitat for species such as golden eagle, red-tailed hawk, prairie falcon, and great horned owl is not present near the DQEP area.

An inventory of historic raptor nesting activity within the propose expansion area was conducted for the Huxtable Quarry EA (BLM 2005), and no nest sites were located within the potential disturbance zone of the quarry. In addition, no raptor nests were observed, and no raptor activity was noted in or near the area during a site visit in February 2011. It is likely that a few species

such as golden eagle, red-tailed hawk, northern harrier, and great horned owl may occasionally hunt over or near the project area.

### 3.11.1.3 Migratory Birds

A number of songbird and other bird species are likely to occur in the area, although songbird diversity is restricted by relatively low vegetation species diversity and structure. Most of the songbirds in the DQEP area are open-country species associated with shrubland habitats. The majority migrates to and from the area and occurs only as summer residents. Many of the summer residents are neotropical migrants that winter in Central and South America. The *Migratory Bird Treaty Act* (MBTA) provides federal legal protection for bird species listed at 50 CFR 10.13. The FWS places the highest management priority on birds of conservation concern (BCC) (FWS 2008). The BCC list was developed because of a 1988 amendment to the Fish and Wildlife Conservation Act. This act mandated that the FWS “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the *Endangered Species Act (ESA) of 1973*.” The goal of the BCC list is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions. These species would be consulted on in accordance with Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001).

The habitats and ranges of the BCC for the Southern Rockies/Colorado Plateau (BCR-16) (FWS 2008) were reviewed to determine which BCC species could potentially occur in the DQEP area. As indicated in table 3.11-1, golden eagle, northern harrier, and prairie falcon are the only BCC species potentially occurring in the area, and these species would only be found occasionally hunting over the area. No suitable nesting habitat is present for these species in or near the area.

### 3.11.2 Environmental Impacts and Mitigation Measures

#### 3.11.2.1 Issues and Evaluation Criteria

Impacts to wildlife inhabiting or using the proposed project area would be considered major if either of the following were to occur.

- Project-related activities would affect designated crucial habitat during an important use period.
- A permanent reduction in the rate of population recruitment for economically important or statute protected species would occur because of project operations.

#### 3.11.2.2 No Action Alternative

Under the No Action Alternative, quarrying operations would not be conducted within the proposed expansion area. Wildlife populations would continue to develop in response to natural fluctuations in vegetation productivity, climate, and inherent disease conditions without any effect from expanded quarry operations.

**Table 3.11-1: Birds of Conservation Concern in the Southern Rockies/Colorado Plateau (BCR-16)**

<b>Common and Scientific Name</b>	<b>Potential to Occur</b>	<b>Rationale for Exclusion</b>	<b>Brief Habitat Description</b>
Bendire's thrasher <i>Toxostoma bendirei</i>	no	no habitat; outside of known range	sparse desert habitats
Black-throated, gray warbler <i>Dendroica nigrescens</i>	no	no habitat	Piñon-juniper, pine, and oak-pine woodlands
Black swift <i>Cypseloides niger</i>	no	no habitat	cliffs near waterfalls
Burrowing Owl <i>Athene cunicularia</i>	no	no habitat	grasslands and sparse shrublands with prairie dogs
Chestnut-collared Longspur <i>Calcarius ornatus</i>	no	no habitat	grasslands
Crissal thrasher <i>Toxostoma dorsale</i>	no	no habitat; outside of known range	desert washes, riparian thickets, foothill scrub, and open piñon-oak-juniper woodlands
Ferruginous hawk <i>Buteo regalis</i>	no	no habitat	grasslands
Flammulated owl <i>Otus flammeolus</i>	no	no habitat	mature ponderosa pine woodlands
Golden eagle <i>Aquila chrysaetos</i>	yes, hunting only; no nesting habitat	na	grasslands, open shrublands
Grace's warbler <i>Dendroica graciae</i>	no	no habitat; outside of known range	pine woodlands
Gray vireo <i>Vireo vicinior</i>	no	no habitat; outside of known range	trees and shrubs
Gunnison sage-grouse <i>Centrocercus urophasianus</i>	no	no habitat; outside of known range	sagebrush
Lewis woodpecker <i>Melanerpes lewis</i>	no	no habitat	open woodlands, farmlands with trees
Marbled godwit <i>Limosa fedoa</i>	no	no habitat; outside of known range	marshes, flooded plains, mudflats, beaches
Mountain plover <i>Charadrius montanus</i>	no	no habitat	sparse grasslands
Northern harrier <i>Circus cyaneus</i>	yes, hunting only; no nesting habitat	na	grasslands, wetlands, open shrublands, nests in wetlands and dense grasslands
Peregrine falcon <i>Falco peregrinus</i>	no	no habitat	riparian habitats, lakes, and rivers; nests on cliffs
Pinyon jay <i>Gymnorhinus cyanocephalus</i>	no	no habitat	piñon and piñon-juniper woodlands

Common and Scientific Name	Potential to Occur	Rationale for Exclusion	Brief Habitat Description
Prairie falcon <i>Falco mexicanus</i>	yes, hunting only; no nesting habitat	na	grasslands and open shrublands, nests on cliffs
Sage sparrow <i>Amphispiza belli</i>	no	no habitat	sagebrush habitats
Short-eared owl <i>Asio flammeus</i>	no	no habitat	marshes and wetlands
Snowy plover <i>Charadrius alexandrinus</i>	no	no habitat; outside of known range	Barren to sparsely vegetated sand beaches along alkaline or saline lakes, reservoirs, and ponds
Solitary sandpiper <i>Tringa solitaria</i>	no	no habitat	edges of ponds, lakes, and rivers
Sprague's pipit <i>Anthus spragueii</i>	no	no habitat	
Swainson's hawk <i>Buteo swainsoni</i>	no	no habitat	farmlands, grasslands
Virginia's warbler <i>Vermivora virginiae</i>	no	no habitat	
Williamson's sapsucker <i>Sphyrapicus thyroideus</i>	no	no habitat	
Wilson's phalarope <i>Phalaropus tricolor</i>	no	no habitat	ponds, lakes, reservoirs
Yellow-billed cuckoo <i>Coccyzus americanus</i>	no	no habitat	riparian woodlands

### 3.11.2.3 Proposed Action

The primary impacts to wildlife from the Proposed Action would be the displacement and short- and long-term loss of habitat for resident species.

As noted above, the proposed expansion area occurs within a region classified by the WGFD as crucial winter/yearlong range for mule deer. The DQEP area is not within any other WGFD-designated important ranges for other big game species. Quarrying and associated activities would result in the additional loss of approximately 24 acres (or less than 0.01 percent) of crucial winter/yearlong range for mule deer. Based on the proposed revegetation/reclamation plan the entire 36-acre quarry footprint would not return to existing conditions. As a result, the value of at least a portion of this area as crucial winter/yearlong range would be permanently lost. Although, the loss of unreclaimed shrub dominated communities, relative to the overall distribution and extent of this habitat throughout designated crucial winter/yearlong range, would be relatively minor.

The displacement of big game species is also an impact that would result from the proposed quarrying operation. The extent of this impact would vary from species to species, and even between individuals, depending upon a given species' or individual's ability to acclimate to mining activities. A number of surface mining operations in Wyoming have demonstrated the ability of big game species to adapt to mining activities, although responses are variable depending on habitats affected and seasonal importance of habitats. Big game displacement

associated with the DQEP area would be of greatest concern with respect to mule deer winter use of the area from November 15 through April 30, since, by definition, crucial ranges are a limiting factor for big game populations. Direct mortality of big game species because of the Proposed Action is unlikely, although there would be an increased risk of big game/vehicle collisions with the proposed increases in haul truck traffic.

In order to mitigate the loss of mule deer crucial winter/yearlong range, Pinnacle has entered into a grant agreement with the Wyoming Game and Fish Commission (Commission) to provide funding for habitat improvement through 2020. The grant agreement provides funding to the Commission for various mule deer habitat improvement projects for the south Converse mule deer herd unit. Because of this grant agreement, the Commission has recommended to the BLM that it waive its restriction precluding Douglas Quarry operations from November 15 through April 30, thus permitting year-round operations. This agreement will have the beneficial effect of improving mule deer winter habitats to compensate for habitat losses associated with the existing and proposed quarry operations.

Quarrying operations would likely displace raptor species utilizing the proposed project area for foraging. Further, the quarrying of an additional 24 acres of habitat (minus an undetermined reclaimed acreage) would result in a permanent habitat loss. Displacement of foraging raptors from a relatively small area would have negligible effects on these highly mobile wide-ranging species. Even though a number of raptor species are known to nest in the region, no nesting has been documented in the area or in surrounding areas potentially affected by quarry operations. Therefore, any potential impacts to raptors nesting near the DQEP area or local raptor populations are unlikely.

Ground and shrub-nesting bird species could experience direct mortality from quarrying operations, though this would likely be a minimal impact given bird mobility capabilities. Nests, eggs, and young would be subject to this impact if expansion occurs during the nesting season. However, these impacts would be relatively minor and unlikely to affect area populations or species viability given the potential habitat disturbance compared to the extent of available similar habitats in the surrounding region. In addition, no nesting BCC species would be affected.

Less than 36 acres of foraging, security, and nesting habitat would be permanently lost to resident bird species, given the acreage to be reclaimed. Proposed reclamation of the quarry pit to rock highwalls, benches, and rubble slopes, in conjunction with the acreage to be revegetated, may reestablish some level of suitable habitat for bird species preferring these types of habitat features.

In summary, Pinnacle's grant agreement with the Commission would mitigate adverse effects to mule deer and mule deer crucial winter/yearlong range. The Proposed Action would not result in a permanent reduction in the rate of population recruitment for economically important or statute protected species. Therefore, impacts to wildlife resources would not be major. A long-term, relatively minor loss of vegetated habitat associated with portions of the pit that would not support existing vegetation communities would occur.

3.11.2 4 Alternative A

Under Alternative A, quarrying operations would occur over a period of 16 years as compared to the five-year life-of-mine for the Proposed Action. The same habitat types and acreage would be impacted. Therefore, under this alternative, the wildlife habitat on site would remain available for use to resident, migratory, and occasional use species for a comparatively longer time before total disturbance occurs. Overall impacts would be the same, but loss of habitat and effects of displacement would be incrementally less for a given time period.

3.11.2 5 Mitigation Measures

No additional mitigation or monitoring activities are required other than Pinnacle’s commitment to its grant agreement with the Wyoming Game and Fish Commission, which is discussed in section 2.1.5, “Applicant-Committed Mitigation Measures.”

**3.12 Threatened, Endangered, and BLM Sensitive Species**

The ESA (16 USC 1531-1543) protects listed threatened and endangered plant and animal species and their critical habitats. A list of threatened, endangered, and candidate species that could occur in Converse County was provided by the FWS (FWS 2011). This list was reviewed to determine whether any such species could occur within the proposed project area.

3.12.1 Federally Listed Plant and Animal Species

One candidate bird, one threatened plant, and one endangered plant are listed with potential for occurrence in Converse County. Table 3.12-1 summarizes these species’ habitat requirements. As indicated in table 3.12-1, the DQEP area does not provide any suitable habitats for any of these three species, and no further analysis is provided for them.

**Table 3.12-1: Federal Listed Threatened, Endangered, Proposed, and Candidate Species in Converse County**

<b>Common and Scientific Name</b>	<b>Status</b>	<b>Potential to Occur</b>	<b>Rationale for Exclusion</b>	<b>Brief Habitat Description</b>
<b>Birds</b>				
Greater sage-grouse <i>Centrocercus urophasianus</i>	Candidate	No	Lack of habitat	Plant communities dominated by sagebrush with a diverse native grass and forb understory
<b>Plants</b>				
Blowout penstemon <i>Penstemon haydenii</i>	Endangered	No	Lack of habitat	Sand blowouts or dunes
Ute ladies’-tresses orchid <i>Spiranthes diluvialis</i>	Threatened	No	Lack of habitat	Riparian edges, gravel bars, old oxbows, high flow channels, moist to wet meadows along perennial streams; high water table typical

### 3.12.1.1 Platte River Species

The FWS has identified five threatened or endangered species that occur in the downstream riverine habitats of the North Platte River in Nebraska. These species include the endangered interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), and whooping crane (*Grus americana*). Threatened species include the piping plover (*Charadrium melodus*) and the Western prairie fringed orchid (*Platanthera praeclara*). These species could be adversely affected to some degree, by project operations resulting in surface water depletions in the North Platte River system.

### 3.12.2 BLM Sensitive Species

The BLM considers sensitive species as those species that could easily become endangered or extinct within the state. Species currently listed as threatened and endangered are not included in the sensitive species list, although any delisted threatened or endangered species is automatically included on the list for a five-year period (BLM 2010).

Table 3.12-2 lists the BLM sensitive species for Converse County, summarizes their essential habitats, and presents a determination their presence within the DQEP area.

As indicated in table 3.12-2, only five wildlife species, fringed myotis, Townsend's big-eared bat, bald eagle, ferruginous hawk, and loggerhead shrike could potentially occur within the DQEP area. Fringed myotis, Townsend's big-eared bat, bald eagle, and ferruginous hawk would only use the DQEP area as foraging habitat since suitable nesting habitat is not present for ferruginous hawk and bald eagle, and suitable maternity and hibernation sites are not present for the two bat species. The loggerhead shrike is a potential inhabitant based on its preference for basin-prairie shrubland vegetation communities.

### 3.12.3 Environmental Impacts and Mitigation Measures

#### 3.12.3.1 Issues and Evaluation Criteria

Impacts to threatened and endangered species would be considered major if the Proposed Action or alternatives would directly or indirectly affect designated critical habitats of these species, and a "may effect" determination was reached by the cooperating agencies for any wildlife species currently listed as either "threatened or endangered" under the ESA.

Impacts to candidate or BLM sensitive species would be considered major if the Proposed Action or alternatives would affect a population of these species resulting in its listing as threatened or endangered.

#### 3.12.3.2 No Action Alternative

Under the No Action Alternative, quarrying operations would not be conducted within the proposed expansion area. There would be no additional effects on downstream water depletions for the Platte River Basin with potential effects on critical habitat for Platte River threatened and

endangered species. There would be no additional effects on candidate or BLM sensitive species.

**Table 3.12-2: BLM Sensitive Species List for Converse County**

<b>Species Common and Scientific Name</b>	<b>Potential to Occur</b>	<b>Rationale for Exclusion<sup>1</sup></b>	<b>Brief Habitat Description<sup>1</sup></b>
<b>Plants</b>			
Laramie columbine <i>Aquilegia laramiense</i>	No	Lack of habitat; elevation	Crevice of granite boulders and cliffs; 6,400-8,000
Laramie false sagebrush <i>Sphaeromeria simplex</i>	No	Lack of habitat; elevation	Cushion plant communities on rocky limestone ridges; 7,500-8,600 feet
Many-stemmed spider-flower <i>Cleome multicaulis</i>	No	Lack of habitat; elevation	Semi-moist, open saline banks of shallow ponds and lakes; 5,900 feet
Nelson's milkvetch <i>Astragalus nelsonianus</i>	No	Lack of habitat	Alkaline flats, shale bluffs and gullies in sparsely vegetated sagebrush, juniper, and cushion plant communities; 5,200 to 7,600 feet
Porter's sagebrush <i>Artemisia porteri</i>	No	Lack of habitat	Sparsely vegetated badlands of ashy or tuffaceous mudstone and clay slopes; 5,300-6,500 feet
Williams' wafer parsnip <i>Cymopterus williamsii</i>	Marginal	Elevation	Open ridgetops and upper slopes with exposed limestone outcrops; 6,000-8,300 feet
<b>Mammals</b>			
Black-tailed prairie dog <i>Cynomys ludovicianus</i>	No	Lack of habitat	Basin-prairie shrublands and grasslands
Fringed myotis <i>Myotis thysanodes</i>	Yes	Foraging habitat only	Desert shrublands, sagebrush-grassland, and woodland habitats with caves, mines, rock crevices, and buildings
Long-eared Myotis <i>Myotis evotis</i>	No	Lack of habitat	Conifer and deciduous forests, caves and mines
Meadow jumping mouse <i>Zapus hudsonius</i>	No	Lack of habitat	Wetlands and riparian habitats
Spotted bat <i>Euderma maculatum</i>	No	Lack of habitat	Cliffs over perennial water, basin-prairie shrublands
Swift fox <i>Vulpes velox</i>	No	Lack of habitat	Grasslands and open shrublands with friable soils
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Yes	Foraging habitat only	Forests, basin-prairie shrublands, caves and mines

<b>Species Common and Scientific Name</b>	<b>Potential to Occur</b>	<b>Rationale for Exclusion<sup>1</sup></b>	<b>Brief Habitat Description<sup>1</sup></b>
White-tailed prairie dog <i>Cynomys leucurus</i>	No	Lack of habitat	Basin-prairie shrublands and grasslands
<b>Birds</b>			
American peregrine falcon <i>Falco peregrinus</i>	No	Lack of habitat	Rivers, lakes, and riparian areas usually near cliffs
Baird's sparrow <i>Ammodramus bairdii</i>	No	Lack of habitat	Native grasslands with little to no grazing activity
Bald eagle <i>Haliaeetus leucocephalus</i>	Yes	Winter foraging habitat only	Lakes, rivers, wetlands, ungulate winter ranges
Brewer's sparrow <i>Spizella breweri</i>	No	Lack of habitat	Sagebrush shrublands
Burrowing owl <i>Athene cunicularia</i>	No	Lack of habitat	Grasslands, basin-prairie shrublands with abandoned prairie dog and ground squirrel burrows
Ferruginous hawk <i>Buteo regalis</i>	Yes	foraging habitat only	Basin-prairie shrublands, grasslands, rock outcrop
Loggerhead shrike <i>Lanius ludovicianus</i>	Yes		Basin-prairie shrublands, mountain-foothill shrublands
Long-billed curlew <i>Numenius americanus</i>	No	Lack of habitat	Grasslands, plains, foothills, wet meadows
Mountain plover <i>Charadrius montanus</i>	No	Lack of habitat	Prairie dog towns and other heavily grazed or disturbed short-grass prairie habitats
Northern goshawk <i>Accipiter gentilis</i>	No	Lack of habitat	Mature, large-tract conifer forests, aspen woodlands
Perigrine falcon <i>Falco perigrinus</i>	No	Lack of habitat	Tall cliffs, riparian, lakes and rivers
Sage thrasher <i>Oreoscoptes montanus</i>	No	Lack of habitat	Sagebrush obligate
Sage sparrow <i>Amphispiza belli</i>	No	Lack of habitat	Sagebrush obligate
Trumpeter swan <i>Cygnus buccinator</i>	No	Lack of habitat	Lakes and ponds, rivers
White-faced ibis <i>Plegadis chihi</i>	No	Lack of habitat	Marshes, wet meadows
Yellow-billed cuckoo <i>Coccyzus americanus</i>	No	Lack of habitat	Riparian deciduous woodland patches
<b>Amphibians</b>			

Species Common and Scientific Name	Potential to Occur	Rationale for Exclusion <sup>1</sup>	Brief Habitat Description <sup>1</sup>
Northern leopard frog <i>Rana pipiens</i>	No	Lack of habitat	Beaver ponds, permanent water in plains and foothills
<sup>1</sup> Rationale for exclusion and habitat descriptions are based on BLM (2002a), BLM (2010), Keinath, D., B. Heidle and G. P. Beauvais (2003), and WYNDD (2007).			

### 3.12.3.3 *Proposed Action*

#### **Platte River Species**

As indicated in “Affected Environment” (section 3.11.1), the Proposed Action would have no effect on threatened and endangered species except for downstream water depletions on Platte River species. The Proposed Action would consume approximately 5,800 gpd or 4.6 AF per year for use in dust abatement on the access road and in conjunction with crushing operation. Water for dust suppression would be obtained from existing water well Enlarged Huxtable #2 owned by the landowner and available to Pinnacle through a temporary water use agreement. Originally, 2.2 AF per year was covered under Wyoming’s depletions plan as part of the PRRIP. The proponent informed the WSEO of a proposed increase from 2.2 AF to approximately 5.1 AF per year (an increase of 2.9 AF per year). A letter from the WSEO dated May 2, 2011 stated that the temporary use of approximately 2.9 AF per year of water from the Enlarged Huxtable #2 well qualified as a “new water-related activity” but is covered under Wyoming’s depletions plan and the PRRIP. Because the water use is temporary, no mitigation is necessary and a Platte River recovery agreement is not necessary (WSEO 2011b). Therefore additional streamlined section 7 consultation with the FWS under the PRRIP in accordance with the ESA is not required.

#### **BLM Sensitive Species - Fringed Myotis, Townsend’s Big-eared Bat, Bald Eagle, and Ferruginous Hawk**

Quarrying operations would likely displace foraging bat and raptor species away from the proposed operation for the duration of quarrying activities and until reclamation activities are complete. The quarrying of an additional 24 acres of habitat (minus an undetermined reclaimed acreage) may result in a permanent habitat loss of foraging habitat. However, the Proposed Action would have no effect on breeding habitat or populations of these species and would not result in a downward population trend toward federal listing.

#### **BLM Sensitive Species - Loggerhead Shrike**

Shrub-nesting bird species like the loggerhead shrike could experience direct mortality from quarrying operations though this would likely be a minimal impact given bird mobility capabilities. Nests, eggs, and young would be subject to this impact when expansion would occur during the nesting season. However, these impacts would be unlikely to affect area populations or species viability given the relatively small amount of disturbance acreage compared to the extent of similar habitats present in the surrounding region. Therefore, it is

unlikely the Proposed Action would result in a downward population trend for loggerhead shrike causing a listing as threatened or endangered.

#### 3.12.3.4 Alternative A

Under Alternative A, quarrying operations would occur over a period of 16 years compared to the five-year life of mine for the Proposed Action. The same habitat types and acreage would be impacted, however annual water consumption would be less and similar to the existing water use of 2.2 acre-feet per year. Therefore, additional consultation with the WSEO and FWS under the PRRIP process would be unnecessary.

#### 3.12.3.5 Mitigation Measures

In 2006, an agreement was signed between the governors of Wyoming, Colorado, and Nebraska, and the U.S. Secretary of the Interior to implement a basin-wide PRRIP. This agreement allows most water depletion projects that are covered by the PRRIP to use a streamlined, programmatic process for addressing depletion-related impacts to Platte River species. Streamlined consultation is made possible by the programmatic biological opinion issued by FWS on June 16, 2006. The opinion determined that the PRRIP, including the continuation of existing and certain new water-related activities in the Platte River Basin, is not likely to jeopardize the continued existence of the four target species or the western prairie fringed orchid, nor adversely modify designated critical habitat in Nebraska.

### **3.13 Cultural Resources**

#### 3.13.1 Affected Environment

The study area for cultural resources includes the project site and surrounding area. Cultural resources are fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that are of importance in human history. Section 106 of the *National Historic Preservation Act of 1966* (as amended) and the *Archaeological Resources Protection Act of 1979* (as amended) protect these resources.

Class II and III cultural resource investigations were conducted in 2003 and 2004 and covered the original 10 acres of the proposed quarry and an additional 30 acres for a 40-acre development alternative. Portions (approximately 19 acres) of the current 30-acre expansion associated with the Proposed Action were not covered by the 2003 and 2004 surveys. Additional class II and class III surveys were recently completed for this area (TEC 2011, Centennial Archaeology, and TEC 2011). These intensive pedestrian inventories of the 19-acre portion of the proposed expansion area not covered in the previous class III survey discovered two minor sites (one historic and one prehistoric), two isolated finds, and one site eligible for nomination to the National Register of Historical Places (NRHP). The earlier (2003 and 2004) findings as well as the two minor sites and two isolated finds found by the 2011 surveys were determined not to be eligible for nomination to the NRHP.

The one site eligible for nomination to the NRHP consisted of a hearth immediately below the surface and some possible spaced stone rings (i.e., tipi rings). It was determined that this site would require Native American consultation with the BLM if any further work is performed on the site. The area of concern is on a small bench southeast and above the current quarry but within the original proposed DQEP area.

### 3.13.2 Environmental Impacts and Mitigation Measures

#### 3.13.2.1 Issues and Evaluation Criteria

Guidelines for determining adverse impacts to any site currently on, or eligible for, the NRHP have been developed by the Advisory Council on Historic Preservation [36 CFR 800.9(b)(1),(2),(3)]. These guidelines indicate that major impacts to cultural resources would include the following:

- destruction or alteration of all or part of an eligible property;
- isolation of a cultural resource from, or alteration of, its surrounding environment;
- introduction of visual, audible, or atmospheric elements that are either out of character with the property or alter its setting; and/or;
- neglect and subsequent deterioration thereof.

These adverse impacts could be in the form of direct, indirect, or cumulative impacts to cultural resources, which are defined below.

1. Direct impacts would result from physical disturbance of the cultural resource, resulting in an adverse effect to the site and its setting. Construction activities would be the primary direct impact affecting identified sites or structures.
2. Indirect effects resulting from implementation of the Proposed Action would not immediately result in the physical alteration of the site or its setting. Construction of an access road into an area containing NRHP eligible sites or structures would allow public access and the potential for subsequent artifact collection.
3. Indirect activities, such as collection, could ultimately alter the overall composition and contextual integrity of the site, resulting in a cumulative impact over time.

Determining the potential effect(s) of any impact depends upon the level of information available. Should the occasion arise where an unavoidable impact to cultural resources either on, or eligible for nomination to the NRHP was identified, the proponent would be required to develop a mitigation plan designed to minimize disturbance to the site. This mitigation plan would be developed in consultation with the State Historic Preservation Officer (SHPO), the appropriate surface management agency (SMA), and, possibly, the relevant Native American tribe. Construction activities would not proceed until both the SHPO and SMA has approved the mitigation plan and it has been implemented.

### 3.13.2.2 No Action Alternative

Under the No Action Alternative, there would be no additional expansion in the existing project area, and no impacts to identified cultural resources would occur.

### 3.13.2.3 Proposed Action

Results of cultural surveys completed for the DQEP area indicate that one of the sites within the original proposed quarry expansion area was eligible for listing on the NRHP. As a result, Pinnacle modified its original proposal for a 40-acre quarry to a 36-acre quarry to avoid any disturbance to the identified cultural site. Therefore, there would be no impact on cultural resources from quarry expansion.

### 3.13.2.4 Alternative A

Impacts from Alternative A would be similar to the Proposed Action.

### 3.13.2.5 Mitigation Measures

No mitigation measures, beyond the applicant-committed measure (section 2.1.5) are needed to protect cultural resources.

## **3.14 Land Use and Recreation**

### 3.14.1 Affected Environment

The project study area for land use includes the existing Douglas Quarry, the access road to the quarry, the public access routes to the quarry and mine offices, and the surrounding land uses within 5 miles of the project.

As described in the introduction, the project area is located at the northeast end of Sheep Mountain approximately 6 miles southwest of Douglas in south-central Converse County. The land is privately owned and surrounded by private property. Topography ranges from steep rugged rock outcrops to relatively gentle slopes towards the northeast. The quarry is located below the crest of Sheep Mountain and within the foothills transition area in the Wyoming Basin along the northern flank of the Laramie Mountain range (BLM 2005). The project area is located within the Platte River drainage system.

The project area has historically been used for livestock grazing, wildlife habitat, some recreation, and aggregate mining. This area provides limited summer and fall grazing for cattle, sheep, and horses. However, stocking rates are low due to the rugged terrain and relatively sparse vegetation (SCS 1988). No prime or unique farmlands occur in the area.

Surrounding land uses include rural residences with acreage, rural residential subdivisions (Cross Minor Subdivision), extensive pipeline and transmission line utility corridors, SH91, Converse County roads 8 and 9, and the historic Mormon Pioneer, Oregon and California trails which are

located predominately within a utility corridor in proximity of the quarry site. Recreational use is confined to private land uses, commercial recreational activities such as big game outfitting, and sightseeing from public roads. No public recreational areas are located close to the immediate project study area.

#### 3.14.1.1 Land Use Regulations

The Casper RMP (BLM 2007a) and the Converse County land use plan (LUP) (Converse County Planning and Zoning Commission 2003) are the principal planning documents with jurisdiction over the study area.

Access to the salable federal mineral estate is at the BLM's discretion and by either free use permit or sales contract. Much of what the BLM sells in the planning area is from individual negotiated or competitive sales. The Casper RMP provides opportunity for mineral sales within the project area. The BLM's policy is to make these materials available unless it is detrimental to the public's interest to do so. When made available, exploration for and removal of these minerals must protect public surface resources and the environment, and minimize damage to public health and safety.

Management actions for salable minerals determine areas open or closed to mineral material development and identify restrictions needed to protect other resource values. Section 1.3.1 contains detailed information from the BLM Casper RMP related to the Douglas Quarry expansion proposal.

The Converse County LUP designates the study area as primarily agricultural use. Mineral extraction has been exempted from any local regulations. Per the LUP, landowners, local governments and industry are encouraged to cooperate to mitigate the impact on the county level. The goals of the land use plan are as follows.

- Minimize the conflict between mineral extraction and the historic surface use.
- Discourage non-compatible increases in the intensity of the surface use in areas underlain by extractable minerals.
- Where mineral development is increasing the demands on county facilities (i.e. roads), industry should participate in upgrading the roads to handle the anticipated traffic. Improvements shall meet or exceed minimum design standards (CRF Standards Manual).
- Temporary workers' quarters shall meet minimum state and county health department requirements.
- Trash and waste from mining and processing shall be handled to meet solid hazardous waste disposal requirements of Federal, State, and county governments.
- Industry should provide funding to address infrastructure needs of its temporary and permanent employees prior to starting operations.

### 3.14.1.2 Planned Land Uses and Developments

Surrounding land uses near the immediate project area are agricultural. However, in the past five years several new rural residences have been built along SH91. The Cross Minor Subdivision is located immediately north of the entrance to the quarry. Several new homes have been built in the subdivision and other lots are available. Planned land uses include rural residences in the immediate project area.

### 3.14.2 Environmental Impacts and Mitigation Measures

Impact issues include direct changes or disruptions to existing or planned uses that may occur during operation of the expansion project.

#### 3.14.2.1 Issues and Evaluation Criteria

Impacts to land use would be major if the proposed project or alternatives:

- resulted in the termination or unauthorized change in land uses; or,
- were inconsistent with adopted land use plans or regulations of local, state, or federal agencies.

#### 3.14.2.2 No Action Alternative

Under the No Action Alternative, the current mine would only operate until existing negotiated material sales are depleted within the original 10-acre quarry footprint. There would be no additional development in the existing project area, and no additional impacts to existing land uses would occur.

#### 3.14.2.3 Proposed Action

Predominant land uses near the proposed quarry expansion include the existing operating quarry, agricultural uses (primarily grazing), rural residential, and utility corridors. The surrounding land is privately owned. The expansion of the existing quarry would not affect the economic viability of any of the agricultural uses within the project area or change these land uses. No impacts are anticipated to agricultural uses outside the project boundary other than possible accidental haul truck collisions with livestock. This has not been identified as an issue with existing quarry operations, but could be a direct, minor, and adverse impact for the life of the mine.

Visual impacts of the proposed project would change the current aesthetic of the viewing area. The contrast created by the quarry would be more visible to the common viewer. Section 3.15, “Visual Resources,” contains a discussion on visual impacts.

State highways 91 and 96 currently provide access to the quarry. Increased truck traffic would occur only along SH91 (6am to 6pm, 7 days per week). Impacts from increased traffic would be

related to increased noise, dust, and safety hazards for residences located along these roadways. In addition, disruptions due to increased noise, dust, and visual effects (including night lighting) of quarry operations would occur and would affect residences in vicinity of the mine operations. As indicated in sections 3.5 and 3.6 adverse impacts from dust and noise emissions would be relatively minor and short-term. Impacts from increased truck traffic would be direct, relatively short-term, and moderately adverse (section 3.17). Safe driving conditions would be maintained by the road use agreement developed between Pinnacle and WYDOT and Pinnacle's mitigation measures (section 2.1.5).

The Converse County LUP stipulates where mineral development creates additional demands on county facilities, specifically roads, industry should participate in upgrading the roads to the minimum county standard. SH91 and SH96 are in poor condition and require immediate improvement for safe driving conditions. As indicated in section 3.17 and section 2.1.5 under Transportation, Pinnacle has met with WYDOT regarding the deterioration of road surface along state highways 91 and 96 resulting from Douglas Quarry truck transport traffic, and they have developed a road use agreement to maintain safe road conditions and allow for continued haulage from the Douglas Quarry. The agreement restricts haulage near the Douglas Quarry to SH91 (Cold Springs Road) and the I-25 interchange. No Douglas Quarry haulage will be permitted on SH96 (La Prele Road). Douglas quarry aggregate haul trucks must also comply with legal load limits with no special permits allowed. The legal load limit for trucks used to haul aggregate from the Douglas Quarry is 80,000 pounds for gross vehicle weight. Pinnacle will also provide funding assistance to WYDOT, as necessary, to accomplish maintenance objectives agreed upon by Pinnacle and WYDOT. Communication between both parties will occur frequently to ensure that SH91 is maintained in a safe and stable condition for Douglas Quarry aggregate delivery trucks and local residents (section 2.1.5). Because of this road use agreement, deterioration of SH91 is not anticipated, and safe driving conditions would be maintained on this highway.

The proposed expansion to develop mineral materials is in conformance with the 2007 Casper RMP (BLM 2007a).

Planned land uses within the immediate project area include additional rural residences. These residences would be exposed to direct and moderate adverse impacts by increased truck traffic. Other planned land uses (identified in section 3.18.1, "Reasonably Foreseeable Actions"), would not be directly or indirectly impacted by the operation of the proposed project. Direct adverse impacts to future rural residences would be the same as those described previously for existing residences.

#### 3.14.2.4 Alternative A

Impacts associated with Alternative A would be similar to those described for the Proposed Action except haul truck traffic levels would be reduced. However, the duration of exposure of increased truck traffic, minor increases in noise levels, nighttime lighting, and localized increases in airborne particulates would be much longer (17 years instead of 6, including reclamation).

#### 3.14.2.5 Mitigation Measures

Mitigation measures suggested for reducing land use impacts include:

- requiring all truckers to avoid using Jake brakes; and,
- ensuring that dust suppression measures are enforced to reduce dust from truck traffic.

### **3.15 Visual Resources**

#### **3.15.1 Affected Environment**

The foreground visible from key observation points along the county road consists of flat to gently rolling hay meadows, ditches and several lines and clusters of trees. Gently rounded horizontal shapes dominate the view, echoed by the rounded shapes of the cottonwood groves. In contrast, the near foreground also contains several residential and agricultural structures, driveways, and fences. Higher flat-topped benches rising a hundred feet or more above the foreground plain characterize the middle background, which contains the project area. These benches are dissected by drainages heading in the higher country to the west, forming a series of V-shaped valleys opening onto the lower flat and introducing a series of horizontal and diagonal lines. Darker vegetation serves to accentuate the difference in character between the lowlands and foothills benches. Rising behind these benches, Sheep Mountain forms a rounded backdrop with generally smooth curvilinear shapes against the skyline. Vegetation cover varies throughout this background exposing rock and mineral soil in some areas, and covering the surface in others.

The project area is a typical valley floor/uplands interface with benches and steeper slopes climbing to the skyline. It is essentially rural with moderate development and newer homes constructed over the past five years. A number of residences line the county road. Outbuildings and other structures are confined to the immediate vicinity of the dwellings, limiting the cultural component of the landscape to a narrow, discontinuous band along the road. A cylindrical water tank and a rectangular structure are located in the distance to the southwest on the bench in the middle background. All manmade elements are subordinate to the larger natural features and fit well within the pastoral setting. There is a primitive road visible leading generally into the project area, and another ascending the eastern slope of Sheep Mountain a short distance north of the proposed quarry. Both are visible only in the distance and are somewhat subdued. At the same time, however, they do introduce artificial linear shapes into an otherwise rounded natural view.

The existing quarry is located at the base of Sheep Mountain, and a single highwall adds both vertical and horizontal lines contrasting sharply with the softer edges of the exiting landscape. This highwall is partial screened by a small hill located in the foreground of the quarry site. Removal of vegetation and topsoil has exposed the gray-white, tan, and crimson colors of the bedrock, which creates a moderate contrast with the gray-greens and juniper colors of the background as well as with the lush greens and fertile fields of the foreground. The introduction of a distinct line created by a single access road which provides motorized access to the back of the mine and transverses higher on the horizon and draws the attention of the casual observer.

Other project elements that contribute to the overall impacts to the visual quality include the introduction of facilities, equipment, sound, and motion. Movement and noise draws the attention of the casual observer and can affect how a project is perceived. Activities that add an

element of noise to the existing environment and occur on a regular basis include drilling, blasting, excavation, and heavy truck traffic. Other structures associated with the existing quarry include buildings, piping, haul trucks, and equipment such as earth-moving machinery, and an upgraded access road. These facilities are located immediately adjacent to SH91 and contrast sharply with the rural homes and pastoral setting.

### 3.15.2 Environmental Impacts and Mitigation Measures

#### 3.15.2.1 Issues and Evaluation Criteria

Sheep Mountain is currently has a visual resource management (VRM) class II. The VRM class for this area was changed during the completion of the Casper RMP. The original 10-acre mine was approved under the objectives for a VRM class III area as set in the previous land use plan. VRM objectives for the location were to retain, at least partially, the existing character of the landscape. Moderate levels of contrast were acceptable and new visual intrusions could draw the viewer's attention. However, projects should not dominate the landscape. Best management practices for visual resources dictates that the basic elements, which make up the existing landscape (i.e. line, form, color and texture), should be repeated whenever possible. Because the resources in the immediate vicinity were allocated for mineral extraction, the applicant has requested that the expansion be approved under the VRM class III in which the project was initiated. This request would be considered if impacts to visual resources would be within guidelines set for VRM class III areas. The authorized officer may approve an exception, waiver, or modification of this limitation in writing which would include documented supporting analysis.

A site-specific scenic quality evaluation was completed for the project location, and the general project area was ranked as having a high scenic quality. Public comments, scoping meetings and personal conversations with the local residents demonstrates moderate to high sensitivity to the introduction of highly contrasting visual intrusions. The public has expressed concern over maintaining the pastoral character of the existing landscape.

The criteria for impact thresholds were determined using VRM class III objectives and address long-term and cumulative impacts to the natural landscape. They are as follows.

- The project alters the existing character of the landscape.
- The contrast added from the project dominates the existing landscape.
- The WDEQ/LQD approved reclamation plan is not successful and fails to mitigate long-term impacts to visual.

#### 3.15.2.2 No Action Alternative

Under the No Action Alternative, mining activity would cease once existing negotiated sales within the original 10-acre quarry footprint are depleted. The degree of contrast would be as described for the exiting environment and would be mild to moderate. Although the existing

mine draws and holds the attention of the viewer, the mine is subordinate to the existing landscape and does not dominate the view. The impacts to visual resources within the existing landscape would meet with VRM class III objective as determined prior the initial authorization. Reclamation efforts would reduce the amount of contrast; therefore, long-term impacts from key observation points would be minimized and would not exceed any of the threshold criteria. The long-term, residual, and cumulative impacts to visual resources would be relatively minor.

### 3.15.2.3 *Proposed Action*

Viewshed analysis was used to determine locations from which the expansion of the existing quarry could be seen. The proposed quarry expansion area would be within the line of sight for many residents located along Bed Tick Road and from locations at high elevations as far away as Douglas. Viewshed analysis generally ranges in distance between 5 and 15 miles from the proposed project. The 5-mile range was selected for analysis because it was assumed that the local terrain and atmospheric conditions would absorb the majority of visual contrast beyond that point. New homes have been constructed within 5 miles of the project area, and additional homes are likely to be constructed. Some of these homes may be within the line-of-sight of the proposed quarry expansion area. The greatest impacts to visual resources would occur to those residents within 3 miles of the proposed site and would continue until reclamation is complete.

Impacts to visual resources are evaluated by comparing the basic design elements of the proposed action with similar elements characteristic of the existing landscape. The degree to which the proposed action contrasts with these elements is a measure of the impact to visual resources. Other factors used to determine overall impacts include the project's relative location to key observation points, sensitivity of the viewer, the ability of the landscape to absorb the visual intrusions, and life span of the project.

The proposed action would expand the visual intrusion created by mining activities by 24 acres and would extend the life of the quarry for another six years. The proposed expansion would occur at a higher elevation, increasing the distance and extent by which the quarry would be seen. The number of observers would increase accordingly. For analysis purposes, all potential viewers have been divided into two categories. Casual observers (visitors to the area) are less likely to have an emotional connection to the landscape and are generally less affected by changes to the existing environment. Local residents are considered static viewers and would have the greatest potential to be negatively affected by visual intrusions. Therefore, key observation points were selected from the viewpoints of residents located nearest to the quarry along Bed Tick Road and from two pull-offs located on Cold Springs Road. Locations of the viewpoints, views of the existing condition of the current quarry operation, and photo renderings of the proposed action at closure are displayed in appendix A.

As mining activities continue, the forms and shapes created by the exposed bedrock would increase in size and in relative proportion to the existing landscape. For the most part, the new forms created would mirror the natural forms with somewhat harder lines and edges that are more distinct. Highwalls would add distinct horizontal and vertical lines, contrasting with the softer sloping lines of the hillsides. In addition, the course texture of the existing vegetation would contrast with the smoother rock surface. The introduction and vertical lines would create a moderate degree of contrast. This would be further emphasized by disrupting the converging

and sinuous lines of vegetation, which tend to follow natural contours. The highest degree of contrast would be a direct result of changes in color that would accent the modification of landforms and would draw and hold the attention of most observers. The primary colors of the mineral material range from soft gray to light tan with red under tones. At lower elevations, mining activities has exposed dark red color that is representative of the Chugwater Formation. The effect of color changes would be more readily seen depending on atmospheric conditions and the lighter tans and gray color would be more visible during sunny days. However, the underlying reds found in the substrate are the more dominate colors during times with overcast or cloudy conditions. The effect is related to light refraction.

The effectiveness of screening from the low lying hill that are positioned in the immediate forefront of the quarry would only be minimally effective, as most of the disturbance would be above and to the east of the hill slope. Positioning of overburden and topsoil salvage piles would provide additional screening helping to mitigate some of the visual contrast. A second hill with a somewhat higher elevation lies between the mine site and Cold Springs Road. This hill in combination with the other local geological features would screen most of the mine site from Interstate 25. As mining activities reach the higher elevations, this screening would be less effective. It is likely that people traveling the interstate would see some of the mine site. The mine would be seen for short periods and would not draw the attention of most viewers.

Setting and historic land use influence how a project is perceived and is evaluated as part of the overall visual quality. This area has historically been used for ranching and rural development. No other industrial activities occur within the analysis area other than the existing 10-acre quarry site. During development of the initial 10-acre quarry, public concerns were expressed over the visual quality of the landscape, demonstrating the sensitivity of static viewers. The elements of motion, light and sound increase the impacts to visual resources and have a direct effect on public perception. Viewer sensitivity would increase in direct relationship to increases in traffic and noise as well as viewer expectations. The impacts of noise levels associated with the proposed expansion are analyzed in section 3.6.2. The results of this section suggest that the average impacts of noise would increase from existing baseline, but adverse effects on residences in the area would be relatively minor with slightly higher noise levels during peak operation times. Under the Proposed Action, production rates would increase as would the hours of operations. The Proposed Action would permit 12-hour operations, with a reduction in overall activities at the mine site after 6pm. The substantial increase in truck traffic would be limited to the hours of 6am to 6pm. Timing restrictions defined for both the mining operations and truck hauling have a remedial effect on viewer sensitivity, reducing the overall impact. In addition, light sources used during nighttime operations would be shielded and facing inward away from potential viewers outside of the mine area.

Mine noise and equipment movement, coupled with traffic from haul trucks, would detract from the overall visual quality of the landscape setting. Static viewers would be more sensitive to the disruptions and experience more of the impacts than would the casual observer. These impacts would be slightly larger those derived from current operations. Timing restrictions would help to mitigate impacts from noise and movement since many of the residents would be away during the majority of the hours of operations. Impacts to the casual observer (those traveling the county roads or on the Interstate would be much less than those impacts experienced by static

viewers. These viewers would have differing expectations and would not have the same level of emotional attachment to the area.

The remaining factors that influence the overall impacts to visual resources are the lifespan of the project and the quality of the reclamation. Projects considered temporary may have an immediate and short-term impact but successful reclamation can mitigate the majority of long-term impacts. The life span of the proposed action is six years, including one year of reclamation. This alternative would be considered a short-term project. In addition, reclamation efforts have been defined and would minimize long-term visual impacts.

The overall impacts to visual resources from the Proposed Action would result in a moderate to high contrast with the surrounding landscape and would detract from the overall setting of the area. The Proposed Action would draw and hold the attention of the viewer, and viewers that are more sensitive would be moderately impacted. The proposed project would not meet VRM objectives set for VRM class II areas. However, even with a moderate to high contrast rating, the project would not likely dominate the view and would be within VRM class III objectives. This determination is based on the overall amount of contrast, timing restrictions, and the life of the project as well as the reclamation plan. The success of the reclamation would be significant to elevating long-term and residual impacts from the project.

#### 3.15.2.4 *Alternative A*

The physical contrast levels created from the expansion of the mine would be similar to those described for the Proposed Action. Impacts from noise and movement on visual resources would be somewhat less since operation times and the intensity of mining and truck haul activities would be reduced. However, the life of the project would be expanded from 6 to 17 years. The increased lifespan of the project would detract from the overall visual quality of the area for a longer time period and would have a greater impact on both static and casual viewers. Overall, the visual impact conclusions for Alternative A would be similar to the Proposed Action but would occur over a much longer period.

#### 3.15.2.5 *Mitigation Measures*

No mitigation measures are needed for visual resources other than Pinnacle's commitments to operation hours, shielding of operations and lighting with aggregate stockpiles, and successful reclamation after quarry closure.

### **3.16 Socioeconomics**

#### 3.16.1 Affected Environment

This section addresses historical and present socioeconomic conditions in Converse County, Wyoming that would be affected by the Proposed Action. The project area includes regional and local community settings. Table 3.16-1 summarizes specific baseline conditions within the area. The urban community indirectly affected by the expansion of the mine is principally Douglas, Wyoming, although several communities are within commuting distance of the project including Casper, Lusk, and Glenrock.

**Table 3.16-1: Demographic and Economic Data**

Population Growth	1990	2000	2009	% Increase 1990-2009
Converse County, WY	11,128	12,560	13,578	22.0
Douglas	5,076	5,306	6,212	22.4
State of Wyoming	453,690	493,985	544,270	20.0
Miscellaneous Demographic Information	Housing units (2009)	Rental Units	Average Single Family sales price	Median H.H. Income (2008)
Converse County	6,134	601 (9.8%)	\$178,401	\$57,609
State of Wyoming	249,306	28,221 (11.3%)	\$241,622	\$54,735
Jurisdiction	Labor Force	Employed	Unemployed	% Unemployment
Converse County, WY	7,438	7,006	432	5.8
State of Wyoming	293,927	275,217	18,710	6.4

**Source:** U.S Department of Labor 2010; Source: U.S. Department of Commerce 2010b; US Census Bureau 2010.

The major industries within the region include ranching, coal mining, agriculture, oil and natural gas development and production, and railroad. The needs of the community are well served with a 25-bed hospital, approximately 20 restaurants, four clothing stores, two grocery stores, seven gas stations, three convenience stores, a public library, an 18-hole golf course, 20 hotel/motels, a campground, and a variety of specialty shops. Casper, a regional commercial and industrial trade center is within 50 miles of the DQEP area.

3.16.1.1 *Demographics*

Table 3.16.1 also shows population and population trends for the project area. Population in Converse County has increased by 22 percent between 1990 and 2009 compared to 20 percent for the entire state. The city of Douglas has seen a similar increase in population growth. During the period 2000 to 2009, population increased 8.1 percent in Converse County, 17 percent in Douglas, and 10 percent statewide.

The project area has a diverse economic base, with the greatest percentages of total employment occurring in the government, service, and mining sectors. Important industries include coal mining, oil and gas development, ranching, and tourism (U.S. Department of Commerce 2010a).

Employment and unemployment figures and rates for 2009 for Converse County and the state of Wyoming are shown in table 3.16-1. Converse County had an estimated unemployment rate of 5.8 percent compared to the state unemployment rate of 6.4 percent. These unemployment rates are considerably higher than in 2007, before the economic recession of 2008 began.

Unemployment rates have doubled throughout the study area since 2007. Economic conditions are improving, however, and renewed activity in the oil and gas and mining industries is evident throughout the region. Total labor force for Converse County is estimated at 7,438 in 2009, up 7.3 percent from the pre-recession labor force estimate of 6,987. Natrona County is located to the west of Converse County and has an estimated labor force of 40,419.

Table 3.16-2 below displays employment by industrial sector for 2008. The mining sector employed 1,091, representing 12.9 percent of total employment. The construction sector employed 996 (11.8 percent).

**Table 3.16-2: Full-Time and Part-time Employment by Industrial Sector in 2008<sup>1</sup>**

Industrial Sector	Converse County	Percent	State of Wyoming	Percent
Farm	524	6.2	12,699	3.1
Forestry and Fisheries	91	1.0	2,788	<1
Mining	1,091	12.9	34,412	8.5
Construction	996	11.8	38,494	9.5
Manufacturing.	147	1.7	11,768	2.9
T.C.P.U. <sup>2</sup>	526	6.2	22,812	5.6
Wholesale Trade	D <sup>3</sup>		10,038	2.5
Retail Trade	761	9.0	41,584	10.3
F.I.R.E. <sup>4</sup>	585	6.9	34,131	8.4
Services	1,311	15.5	123,991	30.6
Government	1,456	17.2	72,138	17.8
Total All Employment	8,454	100.0	404,885	100.0

**Source:** U.S. Dept. of Commerce 2010b  
<sup>1</sup>Based on North American Industrial Classification System (NAICS); numbers do not round due to disclosure issues.  
<sup>2</sup>Transportation, communication, public utilities  
<sup>3</sup>D= Non-disclosure  
<sup>4</sup>Finance, insurance, real estate

Median and mean hourly wages for mine extraction, drillers, and machine operators in the Wyoming labor market range from \$16.86 to \$24.82 per hour, respectively. The mean annual salary ranges from \$37,520 to \$51,630 (U.S. Department of Labor 2009).

In 2008, average annual wage and salary earnings for all industries in the Converse County were \$45,493 compared to \$45,106 for the entire state (U.S. Department of Commerce 2010b).

Current employment at the Douglas Quarry is 10; including office manager, plant manager, and eight laborers and equipment operators (Freeman 2011). The mine has a current production rate of 20-30,000 tons per month.

Wages at the Douglas Quarry average \$17 per hour. These wages are spent in the local and regional area for housing, goods, and services, and various state and local taxes. Employment and income generated at the mine contribute to the local and regional economy.

### 3.16.1.2 *Housing*

As of July 2009, Converse County had 6,134 total housing units, an 8.2 percent increase from 2000. The average value of a single-family detached unit in 2009 was \$178,401. There were 604 rental units in 2010, with an average monthly rent of \$602 and vacancy rate of 5.1 percent (31 units). Adequate and affordable housing exists in Converse County and Douglas (Wyoming Database Partnership County Profile, Converse County 2011).

### 3.16.1.3 *Federal, State and Local Tax Revenues*

Pinnacle Materials pays tax revenues to federal, state, and local governments. The federal government receives mineral royalties at a rate of \$.63 per ton for negotiated sales contracts based on the July 2010 Wyoming statewide appraised value for sand, gravel, and aggregate production (Foertsch 2011, Heffern 2011). The Wyoming Department of Revenue receives severance and gross products taxes. The severance tax is 2% of taxable value (sales value of production). The gross products tax (production tax) applies the Converse County mill levy (58.873) to total sand and gravel sales at the pit. These revenues are collected by the state and are distributed to Converse County, local governments, and taxing districts. Converse County collects a personal property tax on all equipment used at the mine. The county mill levy is applied to the equipment's assessed value, which is dependent on age and other depreciating factors. In addition to these operations taxes, the state and local governments collect sales and use taxes on all purchases within and outside the state of Wyoming. The current sales and use tax is five percent (four percent state, one percent local). These purchases include both goods and services (tires, tools, fuel, repair services etc.).

#### 3.16.1.4 Property Values

Several residential properties are located near the Douglas Quarry. These residences include ranch properties, smaller residential acreages, and subdivisions. Values for the properties are wide-ranging from less than \$100,000 for mobile homes to slightly less than \$400,000 for new homes. Based on recent sales and county assessments, property values within the study area have increased steadily since the mine began operation in 2005. From 2007 through 2011, all properties reviewed showed increases in valuation and market value.

#### 3.16.2 Environmental Impacts and Mitigation Measures

##### 3.16.2.1 Issues and Evaluation Criteria

The goals of the Casper RMP for socioeconomic resources include the following:

- Provide opportunities to develop national energy resources on BLM-administered lands within the planning area.
- Provide opportunities to develop resources other than those that are energy-related (e.g., grazing, recreation, wildlife, fisheries, tourism, and others) on BLM-administered lands within the planning area.

From previous EA documents, BLM criteria stipulate that affects to socioeconomic resources would be considered potentially major (beneficial) if any of the following were to occur.

- changes in total employment exceed an increase of one percent of the trend;
- changes in local tax revenues exceed an increase or decrease of one percent of the trend; and,
- public infrastructure improvements require current budget increases.

### 3.16.2.2 No Action Alternative

Under the No Action Alternative, mining would cease once negotiated sales within the existing 10-acre quarry site are depleted. There would be no additional development in the existing project area. Current employment, income, tax revenues, and local and regional expenditures by Pinnacle Materials, Inc. quarry and its employees would cease. The impact of the No Action Alternative would be considered direct and indirect, moderately adverse, and short-term, with regard diminished economic activity within the local economy.

### 3.16.2.3 Proposed Action

The proposed project would hire an additional four employees at an annual average wage of around \$35,500. Total annual direct payroll would be approximately \$142,000 (\$852,000 over the life of the project). A portion of this income would be spent in the local area for goods and services. This would have beneficial long-term, moderate, direct, and indirect impacts on local businesses. Workers would be contributing to the local economy in the form of local expenditures for goods, services, housing, insurance, food, and entertainment. These impacts would be considered beneficial economic impacts to the project area. Secondary impacts from indirect employment and expenditures related to mine operations are not estimated, but they would also have a beneficial effect on the local economy.

Adequate facilities, services, and housing are available in the project area for the estimated four new employees. However, SH91 would require increased maintenance to provide an acceptable transportation system for the increased truck traffic along this route. Transportation is discussed in depth in section 3.17.

Based on annual production and sales of 1 million tons of crushed aggregate product, income to the federal government from mineral sales would approximate \$630,000 per year for up to five years or to depletion of the resources. Approximately 49 percent of the federal mineral royalties would be distributed to the state (Grenvik 2011). Annual severance taxes would average two percent of total sales. Ad valorem (production) tax also accrues from sale of the mineral. Based on 1 million tons at the current average at the pit value (\$12/ton 2011), total severance taxes would average \$250,000 per year and ad valorem taxes \$750,000 per year (Arnold 2011). One and a half percent of the two-percent severance tax would stay in the state permanent mineral trust fund; the other one-half percent would go to various state budget items. All of the ad valorem taxes would go directly to Converse County. In addition to these tax revenues, personal property taxes, and sales and use taxes would also accrue annually. Pinnacle estimates annual materials expenditures of \$6.6 million per year for the life of the mine. At the five percent Converse County tax rate, \$330,750 in sales taxes would accrue annually for the next six years. The county would receive the entire county option sales tax (one percent) and approximately 30 percent of the state four percent sales or use tax collection (Yurek 2011).

Employment, tax revenues, and expenditures for truck transportation to and from the quarry are not estimated for the project. These figures could be substantial based on fuel costs and taxation on equipment and vehicles and number of truckers employed.

Pinnacle anticipates an economic impact of an estimated \$18 to \$26 million annually for direct, indirect, and induced effects of the mine operations. This figure includes transport of product to clients (Arnold 2011). These numbers would vary based on production, costs (fuel particularly), taxes and royalties, competition (other producers), oil and gas development and other local development projects. All social and economic direct and indirect impacts of the Proposed Action would be considered beneficial, moderate, and long-term.

The impacts to SH91 and SH96 road surface conditions from increased traffic would require additional improvements. Based on Pinnacle's road use agreement with WYDOT, these impacts would be considered direct, minor, adverse, and short-term due to ongoing increased operation and maintenance on the highway. In addition, Pinnacle would be contributing to both severance and ad valorem taxes, which would also contribute to covering the increased maintenance costs on highways 91 and 96.

Research done at the county assessor's office indicated that property values have not been impacted by the current quarry operations. However, depending upon noise, dust, and visual impacts from night lighting at the quarry and increased truck traffic, properties in proximity to the quarry operation or truck traffic may be negatively impacted. The estimated impact to property values cannot be estimated or projected and would vary depending upon proximity of a property to the mine and haul activities.

Impacts from employment and increased tax revenues would be a moderate, beneficial impact, but not major based on the thresholds presented in the evaluation criteria.

#### 3.16.2.4 *Alternative A*

Under Alternative A, the Douglas Quarry Expansion would operate at production rates similar to existing conditions, and quarry life would be extended to 16 years. No additional employees would be hired, so no additional wages would be paid or primary or secondary income generated. The employees and Pinnacle Materials would sustain the current level of local expenditures.

Production of 280,000 tons per year would generate all of the taxes discussed under the proposed project, just at a lower level. Total tax revenues (mineral royalty, ad valorem, severance, and sales) generated at 280,000 tons would total \$787,570 compared to \$2.8 million for the proposed project. The life of the project would extend to 21 years versus 6 years for the proposed project, guaranteeing employment for a longer term depending on market conditions. The current level of activity is still perceived as a positive economic benefit for the local and regional economy.

Direct and indirect impacts, both positive and negative, would not be as great as for the proposed project, although they would extend over a much longer period (16 years as opposed to five years).

#### 3.16.2.5 *Mitigation Measures*

No mitigation measures are needed for socioeconomic resources other than Pinnacle's committed mitigation measures to assist in maintaining a safe surface and driving conditions along SH91. These are discussed in section 2.1.5, "Applicant-Committed Mitigation Measures" and in the section below.

### **3.17 Transportation**

#### **3.17.1 Affected Environment**

The Douglas Quarry is located in a rural environment. An existing private access/haul road provides access from the quarry to SH91 (figure 2.1-1). Truck transport traffic from the quarry currently uses SH91 and SH96 to transport material from the quarry to the Interstate 25 (I-25) corridor. The market area for deliveries is within an approximate 60-mile radius of the Douglas Quarry. Other Converse County roads are not used unless there is a product delivery location along a road that is not a Wyoming state highway. The affected transportation environment addressed by this document includes SH91 and SH96 (west of I-25) from the private access road to the I-25 corridor.

##### **3.17.1.1 Wyoming State Highway 91**

SH91 (aka Cold Springs Road) begins (milepost 0.0) at its intersection with SH94 (Eastbrook Road), just west of an I-25 underpass and has one lane in each direction. SH91 proceeds north along the west side of I-25 for approximately 1.7 miles where it turns due west. From milepost 0.0-3.0, SH91 has a posted speed of 65 mph/trucks 45 mph. This segment is relatively flat (<3% grade) and has modest shoulders (two to four feet). At milepost 3.0, SH91 turns to the south at a 90-degree T-intersection. The west leg of this intersection is SH96. The south leg of this intersection has stop sign control for the northbound left turns, in a left-turn lane, and yield control for northbound right turns, in a right-turn lane. South of this intersection, SH91 proceeds generally to the south/southwest toward the Douglas Quarry access road. The posted speed along this segment of SH91 is 55 mph/trucks 45 mph. The access road is approximately at milepost 7.0. From milepost 3.0 to 7.0, the shoulders along SH91 are not adequate. This segment is in rolling terrain with a number of horizontal and vertical curves that create "blind" situations for vehicles approaching from opposite directions. Vehicles, particularly trucks, were observed to cross the centerline, which is hazardous to oncoming traffic, especially since there are no shoulders.

The WYDOT has posted a number of "road damage" signs along SH91. The road damage is primarily in the direction of the loaded trucks exiting the existing Douglas Quarry. This is considered to be in the northbound direction. WYDOT has issued a "Weight Restriction and Speed Reduction" memorandum for SH91. The speed reduction (45 mph) has been posted, but the weight restriction has not been implemented. The WYDOT District 2 Resident Engineer has indicated the weight restriction would likely be enforced in the near future because of increasing incidents of road damage. WYDOT recently completed a three-inch asphalt overlay of SH91 during the summer of 2011. Although this overlay improved the surface and provided some additional structural depth to the road itself, it did not create additional width or shoulders to the paved surface. A full reconstruction of SH91 would not occur until 2016 or later.

The most recent published traffic counts, from WYDOT, are dated 2008. The 2008 traffic counts are depicted on figure 3.17-1. Conversations with WYDOT staff indicated that there would likely be a modest one to four percent increase for 2010. According to recent increases in truck traffic related to the existing Douglas Quarry, the traffic on SH91 is likely to be higher than that indicated by WYDOT staff. In lieu of actual traffic counts, the quarry operator (Pinnacle Materials, Inc.) was contacted to obtain information on the current truck haul operations.

Activity at the quarry is both market and weather dependent. On an average weekday, the number of loaded trucks leaving the site is 29, resulting in a total of 58 truck trips to and from the quarry (or approximately 6 truck trips per hour for a 10-hour day). Currently loaded trucks leave the quarry and travel on SH91 from milepost 7.0 (site access) to milepost 3.0. At milepost 3.0, the trucks either continue on SH91 toward Douglas or use SH96 toward I-25, depending upon the market for the quarry product.

WYDOT's five-year (2006-2010) accident history lists four accidents from milepost 0.0-3.0. All accidents involved only passenger car vehicles. Three of these accidents involved multiple vehicles and one involved a deer. There was one injury accident. One fatal accident involved alcohol. There were two accidents from milepost 3.0-7.0. Both accidents involved only passenger car vehicles, and they were single vehicle accidents involving a cow and a roadside object. The Converse County Sheriff's Office has received an increase in the number of complaints with regard to truck traffic along SH91. Most complaints related to speed, vehicles not operating in the proper lane, and truck drivers ignoring control devices (stop signs). The Converse County Sheriff has made a number of traffic stops issuing warnings and citations.

#### 3.17.1.2 Wyoming State Highway 96

SH96 begins (milepost 0.0) at its intersection with SH91 and proceeds west terminating 3.1 miles at I-25 Interchange 146. This segment has one travel lane in each direction with a posted speed of 65 mph/trucks 45 mph. The terrain is rolling, and there are a few horizontal and vertical curves from milepost 0.0 to approximately milepost 3.0. At milepost 3.0, SH96 turns to the north at a 90-degree T-intersection where it terminates at I-25 Interchange 146. The I-25 Interchange 146 has a diamond interchange configuration.

WYDOT has posted "road damage" signs along SH96. The road damage is primarily in the direction of the loaded trucks exiting the existing Douglas Quarry. This is considered to be in the westbound direction. WYDOT has issued a "Weight Restriction and Speed Reduction" memorandum for SH96. Similar to SH91, the speed reduction (45 mph) has been posted, but the weight restriction has not been implemented. The WYDOT District 2 Resident Engineer has indicated the weight restriction would likely be enforced in the near future because of increasing incidents of road damage. WYDOT recently completed a three-inch asphalt overlay of SH96 during the summer of 2011. Although this overlay improved the surface and provided some additional structural depth to the road itself, it did not create additional width or shoulders to the paved surface. A full reconstruction of SH96 would not occur until 2016 or later.

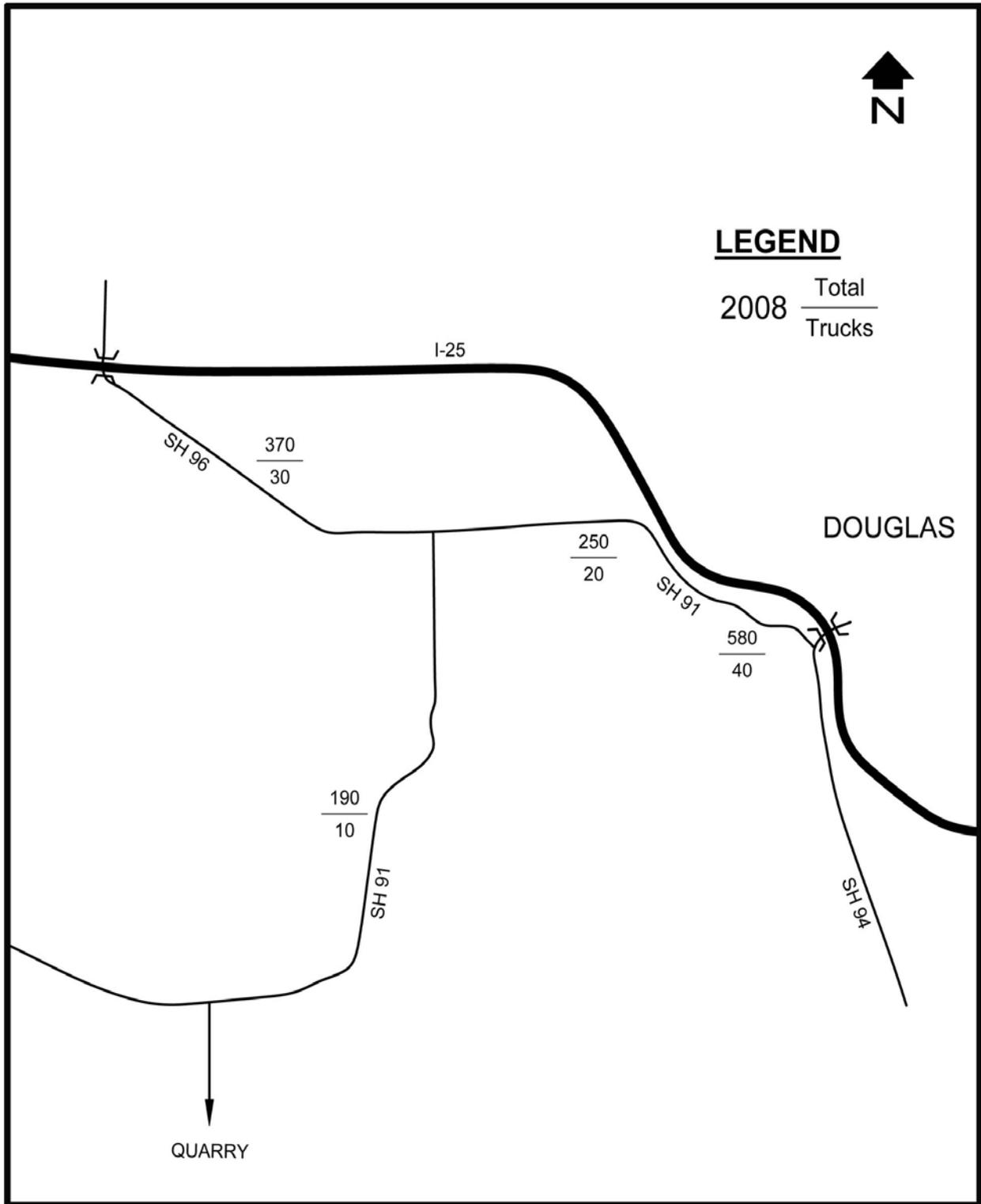


Figure 3.17-1: Recent Daily Traffic Counts Near the DQEP Area

The most recent published traffic counts, from WYDOT, are dated 2008 and are depicted in figure 3.17-1. WYDOT staff indicated that there would likely be a modest one to four percent increase in traffic for 2010. According to recent increases in truck traffic related to the existing Douglas Quarry, the traffic on SH96 is likely to be higher than that indicated by WYDOT staff.

In lieu of actual traffic counts, the quarry operator (Pinnacle Materials, Inc.) was contacted to obtain information on the current truck haul operations. Activity at the quarry is both market and weather dependent. On an average weekday, the number of loaded trucks leaving the site is 29, resulting in a total of 58 truck trips to and from the quarry (or approximately 6 truck trips per hour for a 10-hour day). Currently loaded trucks leave the quarry and travel on SH91 from milepost 7.0 (site access) to milepost 3.0. At milepost 3.0, the trucks either remain on SH91 to/from Douglas or use SH96 to/from I-25, depending on the market location for the quarry product.

WYDOT's five-year (2006-2010) accident history lists three accidents on SH96. All accidents involved only passenger car vehicles. Two of these accidents were single vehicle accidents involving a deer and a fixed object. The fixed object accident had an injury. One accident was a head-on accident with two injuries reported. The Converse County Sheriff's Office has received an increase in the number of complaints with regard to truck traffic along SH96. Most complaints were related to speed, vehicles not operating in the proper lane, and truck drivers ignoring control devices (stop signs). The Converse County Sheriff has made a number of traffic stops issuing warnings and citations.

### 3.17.1.3 School Bus Activity

Converse County School District #1 (CCSD#1) operates three school bus routes on SH91 and SH96. The morning routes begin at the bus garage, proceeding on the designated route picking up all school age children (regardless of grade), then delivering children to each of the schools in Douglas. The afternoon route begins at the Middle School, then to the other schools, proceeding on the designated route dropping off all school age children, then returning to the bus garage.

Bus #22 operates on SH91. In the morning, it enters SH91 at milepost 0.0, but the first pickup is south of milepost 3.0 at 7:14am. This stop is on SH91, between milepost 3.0 and 6.0. This bus has no stops on SH91 between milepost 0.0 and 3.0. It then proceeds to milepost 7.0 picking up children and turns around at the quarry access road at 7:19am. All children living beyond milepost 7.0 arrive at this turn around location by private vehicles. Bus #22 returns to the schools within Douglas via Converse County Road 9 (Chalk Buttes Road). In the afternoon, Bus #22 reverses the morning route, turning around at the quarry access road at 4:07pm. Bus #22 has one stop on SH91, between milepost 6.0 and 3.0 at 4:15pm, and then returns to the bus garage.

Bus #20 serves the residences along SH91 from milepost 0.0-3.0 and along SH96 from milepost 0.0 to 3.1. In the morning, Bus #20 travels on I-25 to Interchange 151 and then picks up children along SH96 and along SH91 (between milepost 3.0 and 0.0) between 7:26 and 7:42am. In the afternoon, this route reverses, and children are dropped off along SH91 (between milepost 0.0 and 3.0) and along SH96 between 3:35 and 3:56pm.

Bus #19 uses SH91 and SH96 to reach its designated route on Converse County Road 11 (Spring Canyon Road) and Converse County Road 13 (Natural Bridge Road) but makes no stops along SH91 or SH96.

### 3.17.2 Environmental Impacts and Mitigation Measures

The following sections describe the transportation impacts and mitigation measures related to three quarry operation alternatives: a) No Action, b) Proposed Action, and c) Alternative A. Transportation impacts are discussed based on projected average daily conditions. There may be peak days or peak periods (several days) of higher activity. However, these higher levels of activity are not expected to last very long.

#### 3.17.2.1 Issues and Evaluation Criteria

The primary transportation issues associated with continued operation of the Douglas Quarry are the following.

- Continued deterioration of the pavement surface of SH91 and SH96 resulting in unsafe driving conditions.
- Unsafe driving practices of haul trucks drivers resulting in hazardous driving conditions.

Impacts to transportation resources would be considered major if the following was to occur.

- Surface pavement conditions of SH91 and SH96 continue to deteriorate resulting in unsafe driving conditions.

#### 3.17.2.2 No Action Alternative

Under the No Action Alternative, the quarry operation would continue at its current production level until the approved contract amounts are depleted. The current quarry-related daily truck traffic on SH91 (milepost 3.0 to milepost 7.0) is 29 loaded trucks outbound and 29 empty trucks inbound (total of 58 truck trips/day). Haul trucks primarily operate during daylight hours (about 10 hours per day). Therefore, the average hourly truck traffic rate is three outbound and three inbound, for a total of six. Previously at SH91, milepost 3.0, the trucks could remain on SH91 to or from Douglas or proceed on SH96 to or from I-25 Interchange 146, depending on the market locations. Because of Pinnacle's recent road use agreement with WYDOT, all future Douglas Quarry haul truck traffic would be restricted to the SH91 route.

Pinnacle has met with WYDOT regarding the deterioration of road surface along state highways 91 and 96 resulting from Douglas Quarry truck transport traffic, and they have developed a road use agreement to maintain safe road conditions and allow for continued haulage from the Douglas Quarry. The agreement restricts haulage near the Douglas Quarry to SH91 (Cold Springs Road) and the I-25 interchange. No haulage will be permitted on SH96 (La Prele Road). Douglas quarry aggregate haul trucks must also comply with legal load limits with no special permits allowed. The legal load limit for trucks used to haul aggregate from the Douglas Quarry is 80,000 pounds for gross vehicle weight. Pinnacle will also provide funding assistance to

WYDOT, as necessary, to accomplish maintenance objectives agreed upon by Pinnacle and WYDOT. Communication between both parties will occur frequently to ensure that SH91 is maintained in a safe and stable condition for Douglas Quarry aggregate delivery trucks and local residents (section 2.1.5). Because of this road use agreement, deterioration of SH91 is not anticipated, and safe driving conditions would be maintained on this highway.

The No Action Alternative would maintain haul truck traffic levels at the current levels, but these levels would be relatively short-term since truck haulage would cease once the approved contracts are depleted. Surface conditions for SH91 would be improved over the existing condition because of the road use agreement developed between WYDOT and Pinnacle.

### 3.17.2.3 *Proposed Action*

Under the Proposed Action, annual production at the quarry would be about 1,000,000 tons per year. The expected quarry life would be five years. The Proposed Action proposes that truck transport activity would occur for 12 hours per day (6am to 6pm), 7 days per week.

At an average truck capacity of 24 tons, the number of loaded trucks would be 41,670 per year, with a daily average of 125 trucks per day (table 2.2-1), or 250 truck trips total (loaded and unloaded). The average number of loaded trucks per hour would be about 11. An empty truck enters the quarry site approximately 15 to 30 minutes prior to leaving the site fully loaded. Therefore, the total truck traffic would be about 22 trucks per hour. Based on Pinnacle's road use agreement with WYDOT (sections 2.1.3 and 2.1.5), all truck traffic would be on SH91 to the I-25 Interchange. The road use agreement would also prevent continued deterioration of SH91, and safe driving conditions would be maintained on this highway. Figure 3.17-2 shows an approximation of the total daily vehicles and truck traffic forecast on segments of SH91 under the Proposed Action.

Compared to the recent daily traffic counts, the Proposed Action Alternative would cause a substantial increase in haul truck traffic on SH91 on a daily basis for a five-year period. During the daylight hours (approximately 12 hours/day), truck traffic would increase from six per hour to 22 per hour. There would be no haul truck traffic between 6pm and 6am. The level of activity proposed would occur on both weekdays and weekends. It is likely this would be noticeable to area residents and other users of these highways. The increase in truck traffic could cause an increase in road damage, but the 80,000-pound gross vehicle weight restriction agreed upon by Pinnacle would lessen the severity and frequency of pavement damage. The road use agreement between Pinnacle and WYDOT would also provide for any necessary pavement repairs to maintain safe operating conditions on SH91.

Safety and traffic accidents are often measured against the amount of traffic on a given highway and the vehicle mix. It is likely that the risk of traffic incidents and/or accidents would increase due to the increase in truck traffic, but an actual increase in potential traffic accidents is impossible to predict. The increase would be primarily during daylight hours since truck haulage would only occur between 6am and 6pm. The increase in truck traffic would also occur during the morning and afternoon when school buses are on their respective routes. While the school bus routes have defined schedules, truck traffic is somewhat random.

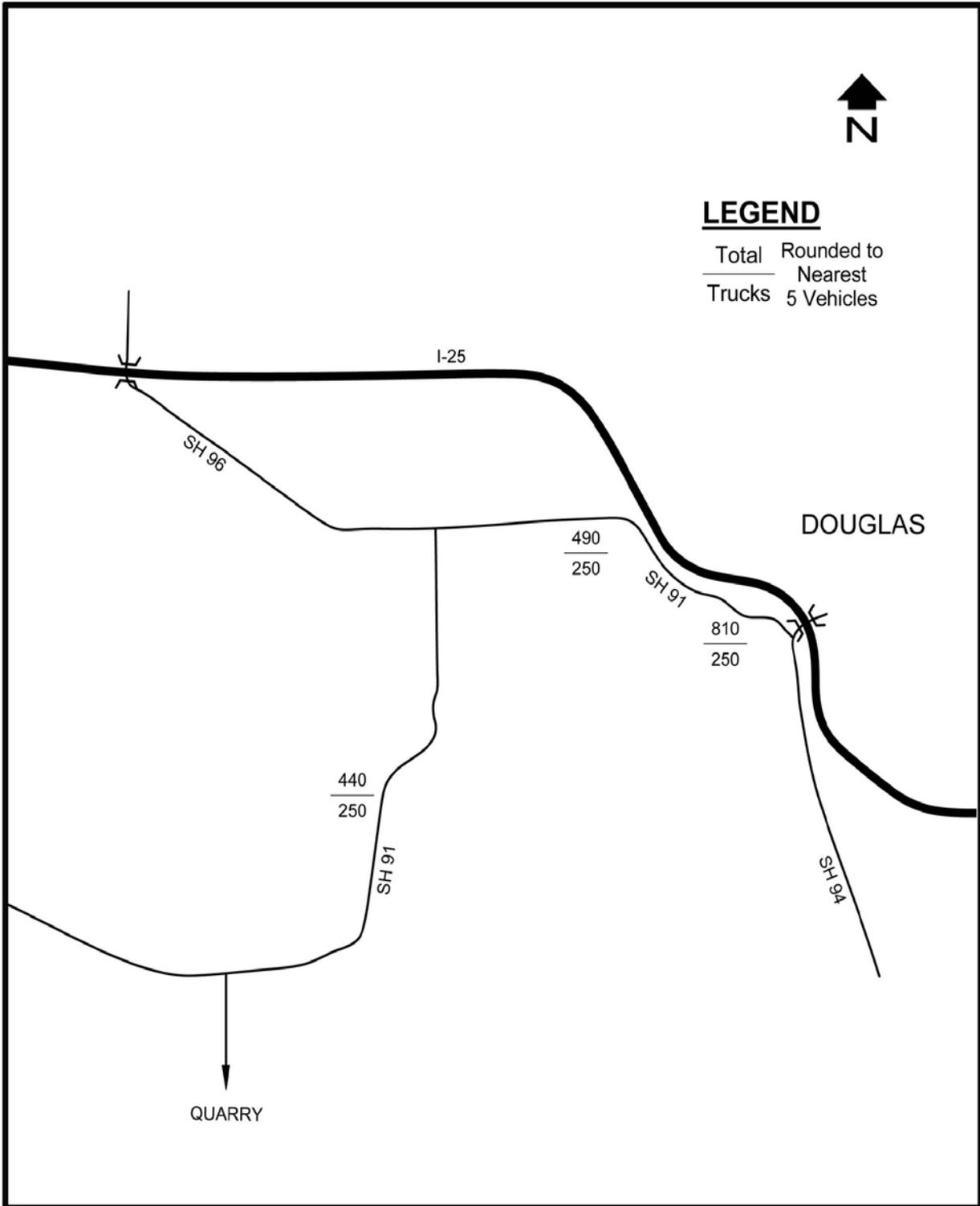


Figure 3.17-2: Daily Traffic Forecast Near the DQEP Area for the Proposed Action

A higher number of trucks on a given segment of highway increases the probability that one or more trucks would be on the highway during the same time that a school bus is present. For Bus #22, with a stop between mileposts 3.0 and 6.0 and another at milepost 7.0 on SH91 over an approximate 5 to 8 minute period, there would be an average increase in haul truck exposure from one truck or less (existing condition) to two to three trucks (Proposed Action) for the morning and afternoon routes. For Bus #20, with stops between mileposts 0.0 and 3.0 on SH91 over an approximate 8 to 10 minute period, there would be an average increase in haul truck exposure from one truck or less (existing condition) to three to four trucks (Proposed Action) for the morning and afternoon routes.

Unsafe driving practices by haul truck operators associated with the Douglas Quarry operation would increase the risk of traffic accidents associated with increased truck traffic. Pinnacle has committed to using trucking contractors that abide by safe driving practices, and will inform all of its trucking contractors that it will not tolerate any unsafe driving practices by their drivers. The “Applicant-Committed Mitigation Measures” are discussed in section 2.1.5. Pinnacle also has initiated an open-door policy for receiving and reviewing complaints from local residents and other users of SH91. Although Pinnacle has no police powers over the driving practices of drivers with contracted hauling companies, it can and will request that its trucking contractors cease using identified unsafe haul truck drivers for hauling aggregate from the quarry. Lack of responsiveness to these requests would jeopardize a truck company’s continuation of contract with Pinnacle (section 2.1.5).

Based on the applicant-committed mitigation measures there would not be an increase in haul trucks on SH96 (in fact haul truck traffic would decrease). There would be a substantial increase in haul truck traffic on SH91. However, the road use agreement reached between Pinnacle and WYDOT would maintain safe surface conditions along SH91. In addition, Pinnacle’s commitment to use only trucking contractors that are committed to safe driving practices would minimize the risk of increased truck traffic increasing traffic accidents. Therefore, although truck traffic levels would be substantially increased, impacts to transportation resources from the Proposed Action would not be major.

#### 3.17.2.4 *Alternative A*

Under Alternative A, the quarry annual production would be 280,000 tons. The expected quarry life would be 16 years. With Alternative A, quarrying and truck activity would occur for 8 hours per day, 6 days per week.

At an average truck capacity of 24 tons, the number of loaded trucks would be 11,670 per year and 47 per day (table 2.2-1). The average number of loaded trucks would be six per hour resulting in average total truck traffic of 12 trucks per hour. The increase would be much less than for the Proposed Action, but the duration of the increase would be for 16 years compared to five years for the Proposed Action. Haul truck routes would be the same as those described for the Proposed Action. Figure 3.17-3 shows an approximation of the total daily vehicles and truck traffic forecast on segments of SH91 and SH96 under Alternative A. Truck haulage from the Douglas Quarry would be restricted to SH91 based on Pinnacle’s road use agreement with WYDOT.

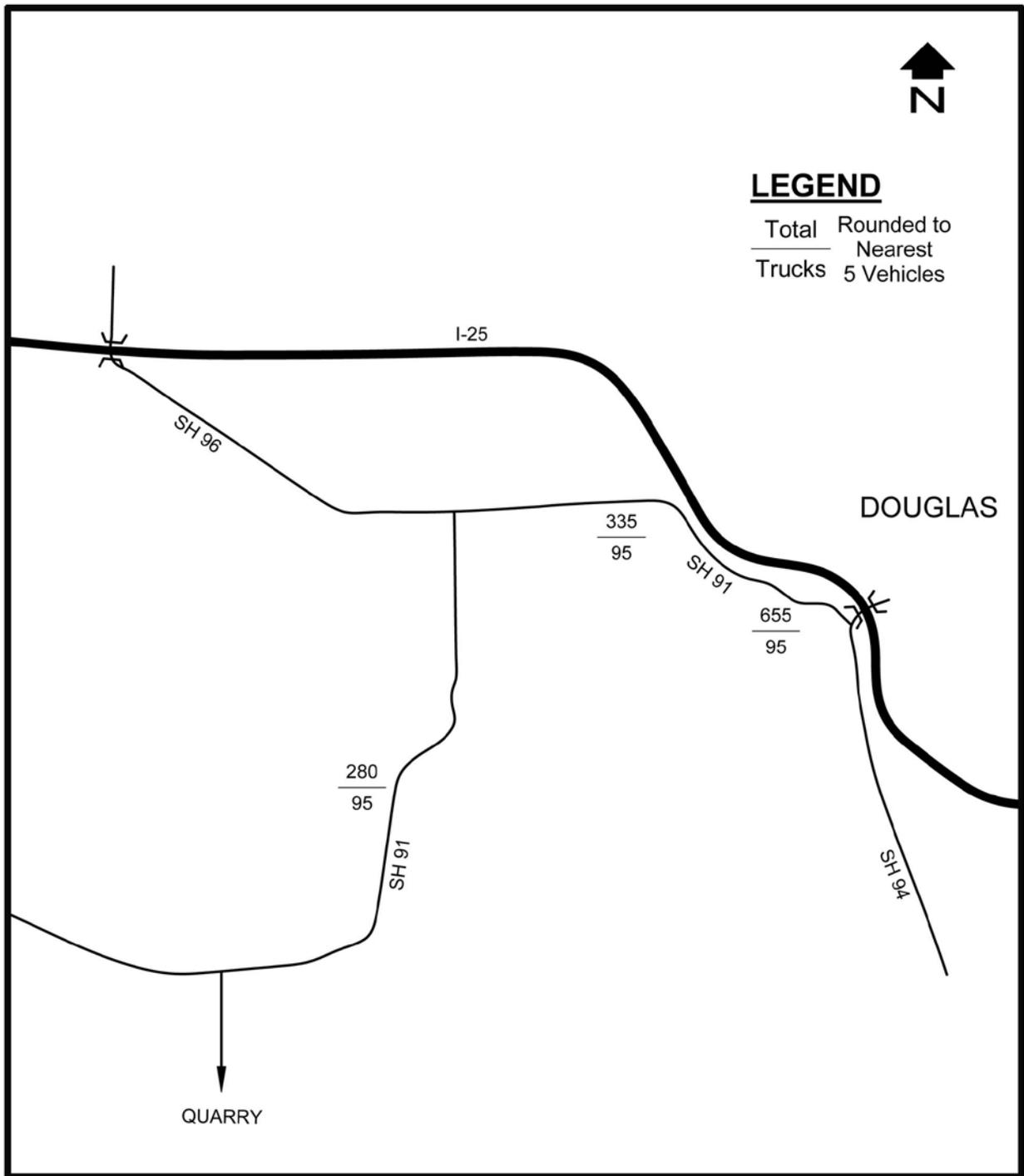


Figure 3.17-3: Daily Traffic Forecast Near the DQEP Area for Alternative A

Compared to recent daily traffic counts, Alternative A would cause a substantial increase in haul truck traffic on SH91, but much less of an increase than the Proposed Action. During the 8 hours of trucking operation, haul truck traffic on SH91 would increase from six per hour to around 12 per hour. During the other 16 hours of the day, the truck traffic associated with the Douglas Quarry would remain at zero. The level of activity proposed would occur only on weekdays but would be for a longer period than the Proposed Action (16 years versus five years). It is likely that this will be noticeable to area residents and other users of these highways.

The increase in truck traffic could cause an increase in road damage, but the 80,000-pound gross vehicle weight restriction agreed upon by Pinnacle would lessen the severity and frequency of pavement damage. The road use agreement between Pinnacle and WYDOT would also provide for any necessary pavement repairs to maintain safe operating conditions on SH91. Applicant-committed mitigation measures for transportation resources (section 2.1.5) would also be applicable to Alternative A. As indicated under the No Action and Proposed Action discussions, the road use agreement reached between Pinnacle and WYDOT would maintain safe surface conditions along SH91.

Safety and traffic accidents are often measured against the amount of traffic on a given highway and the vehicle mix. It is likely that the risk of traffic incidents and/or accidents would increase due to the increase in truck traffic, but an actual increase in potential traffic accidents is impossible to predict. The increased risk would be less than for the Proposed Action since haul truck traffic rates would be reduced from 22 to 12 per hour. The increase would be primarily during daylight hours since truck haulage would only occur between 8am and 4pm. There would also be a minor increase in truck traffic during the morning and afternoon periods when school buses are on their respective routes. While the school bus routes have defined schedules, truck traffic is somewhat random. A higher number of trucks on a given segment of highway increases the probability that one or more trucks would be on the highway during the same time that a school bus is present. For Bus #22, with a stop between mileposts 3.0 and 6.0 and another at milepost 7.0 on SH91 over an approximate 5 to 8 minute period, there would be an average increase in haul truck exposure from one truck or less (existing condition) to one to two trucks (Proposed Action) for the morning and afternoon routes. For Bus #20, with stops between mileposts 0.0 and 3.0 on SH91 over an approximate 8 to 10 minute period, there would be an average increase in haul truck exposure from one truck or less (existing condition) to one to two trucks (Proposed Action) for the morning and afternoon routes.

Based on the applicant-committed mitigation measures (section 2.1.5), there would not be an increase in haul truck on SH96 (in fact haul truck traffic would decrease). There would be a substantial increase in haul truck traffic on SH91 for a 16-year period. However, the road use agreement reached between Pinnacle and WYDOT would maintain safe surface conditions along SH91. Pinnacle's commitment to use only trucking contractors that are committed to safe driving practices would minimize the risk of increased truck traffic increasing traffic accidents. Therefore, although truck traffic levels would be substantially increased, impacts to transportation resources from Alternative A would not be major.

### 3.17.2.5 Mitigation Measures

No mitigation measures are required beyond those committed to by Pinnacle (section 2.1.5).

## 3.18 Cumulative Effects

Cumulative effects are the effects from other projects that are not part of this Proposed Action, which may have an additive effect when combined with the effects expected from the Proposed Action. The cumulative effects area (CEA) analyzed in this EA for most resource disciplines includes Sheep Mountain and areas east of the Douglas Quarry to Interstate 25, including SH91 and SH96. For socioeconomics, the CEA includes the city of Douglas, while the CEA for wildlife includes the south Converse herd unit (hunt area 65).

### 3.18.1 Reasonably Foreseeable Actions

The general project area has been used continuously for agricultural purposes (livestock grazing) since the early twentieth century, and the natural environment of the general project area remains largely unaffected by human-related activities (BLM 2001). Previous surface-disturbing activities within the general DQEP area have been limited primarily to agricultural and rural modifications to the existing landscape. These modifications include the conversion of native vegetation to crops and cropland for the production of domestic livestock forage such as alfalfa, construction of rural highways to serve outlying ranches and residences, and minor surface-disturbing activities associated with the installation of infrastructure (e.g., fences, power lines, telephone lines, etc.) commensurate with the current rural/agricultural land uses in the area. Commercial development in the area to date has been somewhat limited and includes the three facilities discussed below.

- Medicine Bow lateral natural gas pipeline owned and operated by Wyoming Interstate Gas Company. The pipeline right-of-way (ROW) is approximately 1.5 miles to the east of the project area. The pipeline was installed in 2000, and the ROW has since been reclaimed and revegetated.
- Wills Quarry currently owned and operated by Croell Redi-Mix, Inc. The Wills Quarry was approved in 2001 to develop an industrial non-metallic mineral and decorative rock deposit on private surface estate in sections 10, 11, 13, 14, 15 and 23 in T. 31 N., R. 72 W. This quarry is located approximately 2.5 miles southeast of the proposed DQEP area (at its closest point) and is projected to disturb approximately 10 acres per year. Total surface disturbance associated with the Wills Quarry is estimated to be 500 acres over the life of the project, which is estimated to be 75 years (BLM 2001). Haul truck traffic from the quarry to the Interstate 25 corridor uses SH94 north to its junction and terminus with the east end of SH91. From there haul trucks either use Interstate 25 or state highways east of Interstate 25 to deliver aggregate products. Haul truck traffic from the Wills Quarry has no impact on traffic on SH91, which would be used by haul truck traffic in the Proposed Action and Alternative A.

- Huxtable Quarry was owned and operated initially by James Huxtable but in 2010 was leased to Pinnacle Materials, Inc. for continued operation. The name was changed to the Douglas Quarry at that time. The current disturbance footprint for the Douglas Quarry is about 10 acres. The Proposed Action would result in an additional 26 acres of total surface disturbance and 34 acres of long-term surface disturbance after mine closure. This surface disturbance would be in addition to the 500 acres of surface disturbance authorized for the Wills Quarry (BLM 2001). Haul truck traffic associated with the Proposed Action would be restricted to SH91 based on Pinnacle's road use agreement with WYDOT.

Cumulative impacts associated with Alternative A would be similar to those discussed for the Proposed Action. However, annual production and haul truck traffic would be less, and the quarry life would increase from five years to 16 years.

With respect to any other planned state or federal activities, there are no other reasonably foreseeable actions planned for the general area other than the continued operation of the Wills Quarry and possible approval of the proposed Douglas Quarry expansion. Recent re-surfacing of SH91 and SH96 have improved the surface conditions of these two highways, and continued maintenance of SH91 would occur as necessary based on the road use agreement between Pinnacle and WYDOT.

Other foreseeable future developments that would have little effect on the CEA but that would affect traffic levels on Interstate 25, revenues for Converse County and the city of Douglas, and demands for services include the following.

- Continued, and possibly, increased oil and gas exploration and development in the Niobrara shale formation north and east of Douglas, Wyoming.
- Development of the proposed Pioneer Wind Farm projects south of Glenrock along the Mormon Canyon Road. The Wyoming Siting Council and Converse County approved the two 31-turbine projects in 2011, but project construction will not commence until two years of wildlife studies are completed.

### 3.18.2 Cumulative Effects by Resource

#### **Climate and Air Quality**

Because of the nature of the proposed project, any potential air quality effects would be minor, localized, and short-term. Therefore, there is little likelihood of cumulative impacts occurring with other sources of air pollution. There would be no cumulative effects to climate from the Proposed Action or Alternative A.

#### **Noise**

Because of the nature of the proposed project, any potential noise effects would be minor, localized, and short-term. Therefore, there is little likelihood of cumulative impacts occurring

with other sources of noise. Given the pastoral nature of the overall project area and the general lack of substantial existing or future noise emitters near the area, cumulative impacts to noise would be negligible from the implementation of the Proposed Action or Alternative A.

### **Mineral Resources**

The 4.6 million tons of mineral material to be removed from the quarry under the Proposed Action (as well as Alternative A) would be in addition to the 712,000 tons previously removed from the Douglas Quarry. There would also be 28 million tons of mineral material expected to be mined from the Wills Quarry over the estimated life of mine. The Proposed Action would increase mineral material production from this general area of southern Converse County by approximately 16 percent, resulting in a relatively minor increase in cumulative impacts to the mineral resources in the overall area.

### **Groundwater and Surface Water Resources**

Douglas Quarry is the only commercial development within the Bed Tick Creek drainage. The nearby Wills Quarry, Niobrara shale oil drilling (north and east of the city of Douglas), SH91/SH96, and Interstate 25 roadwork could contribute to cumulative indirect adverse impacts to surface water quality due to sedimentation from surface disturbances within the North Platte River drainage basin. However, implementation of appropriate BMPs and mitigation from these projects limits the potential extent of impact on surface water quality in the Bed Tick Creek or North Platte River drainage basins. Therefore, the Proposed Action and Alternative A would not result in any appreciable adverse, cumulative impact on surface water in these drainage basins. The cumulative impacts of existing and foreseeable projects to groundwater resources in the area would also be negligible from the Proposed Action or Alternative A.

### **Soils**

Mine operations associated with the Proposed Action or Alternative A would affect an additional 26 acres. This acreage would be in addition to the existing mine disturbance and associated facilities (approximately 10 acres) and the Wills Quarry proposed disturbance (500 additional acres). The proposed expansion, therefore, represents an approximate five percent increase in impacts to the local soil resource. This represents a negligible cumulative impact to the soil resource of the region.

### **Vegetation**

Vegetation in the CEA would continue to be impacted primarily by on-going livestock grazing. There are no other measurable surface-disturbing activities occurring or any that are expected to occur within the area. Additional rural residential development may occur, but the extent of this development is impossible to predict. The Proposed Action would result in an additional 26 acres of initial and 24 acres of long-term (life of project) removal of vegetation for both the Proposed Action and Alternative A. This loss would be more long-term with Alternative A (16 years versus five years). Ongoing mining activities associated with the Wills Quarry would

result in the eventual removal of vegetation from an additional 500 acres within the general region.

Initial (short-term) disturbance generally associated with disturbance activities outside of the pit area would be reclaimed shortly after disturbance, but could take several years to reach pre-disturbance levels of plant species diversity, especially in terms of shrub composition. The actual quarry areas (for both the Douglas and Wills quarries) would likely never return to pre-disturbance levels of vegetation diversity and composition.

There is no evidence that there are or have been any significant cumulative impacts to vegetation resources within the CEA. No special habitats would be disturbed, no threatened, endangered, or special status plants are known to exist within the project area, and the project proponent would control invasive non-native species, as necessary.

### **Wildlife**

With the Proposed Action and Alternative A there would be an impact to an additional 26 acres of wildlife habitat over and above the estimated 21 acres of impacts associated with the existing Douglas Quarry operation and associated facilities. The proposed Wills Quarry project would potentially affect 500 acres of wildlife habitat. That project area is located outside of designated mule deer crucial winter range and it would not contribute to a cumulative loss of crucial mule deer winter habitat. Wildlife resources in the affected area would continue to be impacted primarily by on-going agricultural (grazing) activities.

Considering all existing and proposed quarrying operations, the proposed 26-acre expansion (discounting the limited acreage to be revegetated) equals an increase in existing and proposed impact of approximately five percent in the CEA. This disturbance, along with existing and projected quarrying operations, would amount to less than one percent of the south Converse mule deer herd unit and less than 0.01 percent of mule deer crucial winter/yearlong range. Short-term (initial) disturbance (associated with access roads and other ancillary facilities) would be reclaimed shortly after disturbance or at mine closure, but could take up to 20 years to reach pre-disturbance levels of species diversity (shrub composition). The actual quarry areas for both this project and Wills Quarry would likely never return to pre-disturbance levels of vegetation diversity and composition and wildlife habitat.

### **Threatened, Endangered, and BLM Sensitive Species**

Cumulative impacts to threatened and endangered species would be limited to the effects of additional water depletions in the North Platte River Basin on downstream species and their habitats. This is discussed in “Platte River Species” in section 3.12.1.1.

Cumulative impacts to BLM sensitive species would likely occur in direct proportion to the amount of disturbance to habitats of the specific species and would be limited to those areas where suitable habitat would be removed or the larger area from which individuals may be displaced by project-related activities.

There is no evidence to indicate there are or have been any measurable cumulative impacts to threatened, endangered, or BLM sensitive species within the CEA.

### **Cultural Resources**

All identified cultural/historical resources within the project area would be avoided or potential impacts mitigated in accordance with BLM/SHPO requirements. Therefore, no adverse cumulative impacts would occur to the cultural resources in the CEA because of the Proposed Action or Alternative A.

### **Land Use and Recreation**

The general area is predominately private surface estate with limited access. Consequently, recreational opportunities for the public within the area are extremely limited. Implementation of the Proposed Action or Alternative A would not change these surface ownership patterns or result in a cumulative reduction in public recreational opportunities in the affected area. A relatively minor increase in cumulative loss of available grazing land for the life of mine and until reclamation is complete.

### **Visual Resources**

The cumulative impacts of visual resources are normally derived from a number of small-scale, local projects that accumulate over time. The impacts are evaluated on a landscape scale and are generally considered long term. As the number of visual intrusions increase, the ability for a landscape to absorb these intrusions deteriorates. Man-made structures within the landscape surrounding the quarry site consist of residential homes, small farms, roads, and power lines. The proposed maintenance that would be required for authorization of the quarry would not apply to any developments within the VRM class II area located on Sheep Mountain. Therefore, the cumulative effect of the expansion would be minor. After completion of the expansion and reclamation, the overall impacts to the landscape would be localized and subordinate to the natural landscape features. The natural topography and rural setting would be the dominate elements within the landscape.

All new developments on public lands and those with mixed ownership would be required to adhere to the VRM objectives set for the project location. The majority of this area has been designated as VRM class II and III. The class objectives would provide for mitigation of impacts from visual intrusions and would help to preserve the rural setting. However, the majority of lands surrounding the quarry site are private. The foreseeable developments on these lands would most likely be new residential homes.

### **Socioeconomics**

No negative cumulative impacts would occur to the socioeconomics of the city of Douglas or to Converse County resulting from implementation of either the Proposed Action or Alternative A. Positive cumulative impacts would include the generation of additional local, state, and federal revenues associated with the production of mineral materials from the proposed quarry

expansion. The quarry would also provide a source of employment for local residents, thereby augmenting the local tax base and providing an additional source of income to the local community.

## **Transportation**

Increases in local traffic would result from implementation of either the Proposed Action or Alternative A. Average daily rates for truck traffic on SH91 to and from the Douglas Quarry would increase 58 trucks per day to an estimated average of 250 trucks per day for the Proposed Action or 95 trucks per day for Alternative A. However, truck traffic associated with Douglas Quarry would only occur on SH91, which is not being used for hauling operations associated with the Wills Quarry. Therefore, increased truck traffic associated with Douglas Quarry would not represent a cumulative increase in the average daily truck traffic on SH91 in conjunction with other mining operations in the cumulative effects area. A cumulative increase in truck traffic could occur at the junction of SH91 with SH94 and beyond this point depending on market destinations for aggregate products from both quarries.

### **3.19 Irreversible and Irretrievable Commitment of Resources**

The phrase “irreversible and commitment of resources” refers to the loss of future options, which would result from mining operations associated with the proposed Douglas Quarry Mineral Materials Expansion Project and primarily applies to impacts on:

- non-renewable resources such as minerals or cultural resources, or to
- processes or factors that are renewable only over long periods of time (e.g., soil productivity).

Likewise, that same phrase refers to the loss of production, harvest, or use of natural resources. For example, some or all of the forage production from an area is irretrievably lost while the area serves as an access road or rock quarry site. Although forage production loss is irretrievable, the action is not irreversible, and if the land use changes through subsequent closure and reclamation of these facilities, forage production would resume to some degree.

The primary irreversible and irretrievable commitment of resources resulting from the implementation of either the Proposed Action or Alternative A would be the removal and use of industrial, non-metallic minerals such as limestone. Other irreversible and irretrievable commitments of resources would include the following.

- soil lost through wind and water erosion as well as salvage restrictions;
- loss of productivity (i.e., forage and wildlife habitat) on rock faces and benches that can't be fully reclaimed;
- inadvertent or accidental destruction of cultural resources;

- direct mortality of wildlife resulting from construction and associated mining activities;
- the labor, materials, and energy expended during mining and subsequent reclamation activities associated with the proposed project; and,
- effects on the area's viewshed resulting from mining activities.